



**FINAL EVALUATION OF THE
SHARED CONTROL OF NATURAL RESOURCES
SUB-PROJECT, SRI LANKA

FINAL REPORT**

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ACRONYMS AND GLOSSARY

AD	Anno Domino (Christian year)
AID	USAID (see below)
ASD	Agrarian Services Department
BA	Bachelor of Arts
BASIS	Broadening Access and Strengthening Input Market System
CA	Cooperative Agreement
CBO	Community Based Organisation
CGIAR	Consultative Group on International Agricultural Research
Chena	Slash and burn agriculture
FO	Farmer Organisation
GIS	Geographic Information System
GON	Government of Nepal
Grama niladhari	Village Headman
GSL	Government of Sri Lanka
HWS	Huruluwewa Water Shed
ID	Irrigation Department
IIMI	International Irrigation Management Institute
Janasaviya	Poverty Allowance
Kithul	Sugar palm native to Sri Lanka
KM	kilometers
LB	left bank
M	Meters
M&E	Monitoring and Evaluation
MIPE	Ministry of Irrigation, Power & Energy
MTE	Mid-Term Evaluation
MM/YR	Millimeters per Year
NAREPP	Natural Resources and Environmental Policy Project
NCP	North Central Province
NGO	Non-Governmental Organisation
NSC	National Steering Committee
NWS	Nilwala Watershed
PACD	Project Assistance Completion Date
Pradeshiya Sabha	Divisional Units
PRA	Participatory rural appraisal
PS	Private Sector
PSC	Provincial Steering Committee
RB	right bank
SCOR	Shared Control of Natural Resources
SPDA	Southern Province Development Authority
SP	Southern Province
TSHDA	Tea Small Holders Development Authority
USAID	United States Agency for International Development
VP	Vegetative propagation
WRMT	Water Resource Management Team

EXECUTIVE SUMMARY

A. Overview

The Shared Control of Natural Resources (SCOR) Sub-Project of the Natural Resources and Environmental Policy Project (NAREPP) was an innovative US \$4.86 million initiative carried out from March 1993 through September 1998 by the International Irrigation Management Institute (IIMI), under a Cooperative Agreement with USAID and the overall guidance of a Project Steering Committee led by the Ministry of Irrigation, Power and Energy of the Government of Sri Lanka (GSL). Its purpose, as revised following the Mid-Term Evaluation in 1995, was to assist the Government of Sri Lanka (GSL) to identify, develop, and field test models for increasing the sustainable productivity of natural resources--mainly land and water--in a watershed context. ..[SCOR pursued] this purpose by assisting Sri Lanka to intensify sustainable productivity of land and water resources within selected watersheds while conserving the physical, biological, and social environments through novel management models and shared control by local user groups and the government involving formal agreements and joint management.¹ Key features of the models to be developed were soil and water conservation and management, changes in cropping patterns and practices, natural resource tenurial security, community participation in resource use planning and development, and state-user partnerships for the management of natural resources.

B. Findings

SCOR contributed to policy changes in the agriculture, irrigation, and forestry sectors which created openings for positive changes in watershed management through increased user control of natural resources. SCOR developed institutional innovations which took advantage of these openings. These have operated well at the project level, and some have been adopted at the national level.

SCOR's overall approach had a number of distinctive features: it was first and foremost an integrated watershed approach, which sought (a) to improve interdisciplinary understanding of changing biophysical, socio-economic, and political systems and (b) to balance conservation with development, protecting the key functions of these systems upon which productivity depends. SCOR also used a participatory approach, seeking to promote broad, multi-leveled participation and collaborative relationships among a range of government agencies, local groups, non-government organizations, and individuals. Finally, it was a learning, action research@ approach, seeking to fill important gaps in our understanding of change and the impacts of alternative decisions. The specific mechanisms which SCOR employed to carry out these approaches were many, including local resource user groups, the use of a cadre of catalysts, financial and technical support through sub-watershed-based mini-projects, market-oriented farmer companies, and a variety of arrangements for sharing resource management responsibilities and benefits between the state and local people.

With some exceptions, SCOR's activities to increase productivity will yield positive benefits only in the mid- to long term. Most have not been adopted on a wide scale because they do not provide sufficient net benefit sufficiently close at hand--in time or space--to the farmer. Nonetheless, through its support to farmer organisations and innovations in organisational forms, SCOR has helped develop new income options for farmers.

C. Conclusions

¹USAID/IIMI, 1995. SCOR Cooperative Agreement, Modification [to the Program Description] No. 4, December 1995.

SCOR's innovative approach created a considerably greater awareness and common understanding of the importance of watersheds and conservation. Particularly in Nilwala, SCOR helped reinforce a sense of stewardship and responsibility among some public and private leaders with respect to creating a wider public good through investments which are longer term and/or more distant from their immediate constituencies. Although neither an easy nor a complete accomplishment, it was an important one. SCOR's success in engaging line agencies and local leadership, however, did not extend to the level of the individual farmer and farm household. Under SCOR, the small holder's and chena cultivator's voice was seldom heard.

It is not yet clear whether the innovations in productivity, resource management, and institutional modes and capacities to which SCOR contributed are well-established enough yet to be sustained. In this regard, the short time-frame of the project imposed a serious constraint.

The role of multiple leadership, at all levels, was critical to SCOR's achievements. Committed leadership played a key role in balancing among differing interests and building trust and commitment. In the midst of the project's very complex context (an inherent characteristic of any multi-agency, multi-level, watershed management initiative), a key task facing project leadership was to focus--to concentrate the project's limited resources on those activities where results were most likely to be achieved. It was appropriate not to narrow too much the focus at the design stage (when the least was known). After the Mid-Term Evaluation, however, a concentrating of focus was essential. This was difficult due to the differing interests among project participants, which also had not been made explicit at the design stage. The result was an over-ambitious agenda--to satisfy the various interests--which, however, could not be effectively carried out, to the frustration of those same interests. The differing interests centered around such issues as research versus development, but also around each group's sense of ownership of the project. The latter included both the differences among the GSL, USAID, and IIMI and also differences among GSL agencies. In the end, the lack of focus and the lack of sufficient consensus on priorities hindered project progress and achievement, and its sought-for transformation from project to program.

D. Recommendations

- o IIMI's final reports under the project, and/or any subsequent reports, should document the consolidation of SCOR's most effective models, clarifying key elements appropriate for replication through programmes at various levels by government, NGOs, or others. IIMI's analysis should identify the characteristics of each element, the principles which should guide its application, and the characteristics of the resource users or agencies that might make use of each model or element.
- o IIMI should invest a blend of international and local intellect, without the pressure to implement, in taking full advantage of the rich ground for learning and understanding which the project has prepared. IIMI's products in this regard should focus on (a) the key themes of the project--shared control, state-user partnerships, etc.--and (b) the needs of national and field level audiences for these products, to ensure that the opportunities for adaptive learning lost during the project period are not lost altogether.
- o The National Steering Committee should commission an in-house study to provide an analysis of current relationships and interests among government and other agencies regarding the key themes of the project--shared control, state-user partnerships, etc. and assessing explicitly the strengths and weaknesses of existing resources, programs, policies, and management of these institutions in these theme areas. The assessment should propose specific roles and responsibilities for these agencies, and the respective level within the agency, with respect to the specific themes, based on institutional capability, legal authority, and credibility for

addressing the issues involved. Following the analysis, and review of the results of the first two recommendations above, the NSC should complete its unfinished business: The NSC should design and implement (a) an appropriate institutional framework for oversight of watershed management issues which cross administrative boundaries, and (b) a plan for continuing the most appropriate of SCOR-initiated models and elements.

I. INTRODUCTION

A. Purpose of the Evaluation

The final evaluation of the Shared Control of Natural Resources (SCOR) Sub-Project, as noted in the terms of reference (see Annex 1), is to concentrate on impacts, sustainability, and lessons learned. Its overall purposes are to assess:

- o The achievement of project objectives, by objective; and
- o Research's contribution to furthering project objectives.

Specific areas of assessment are to include:

- o Achievement,
- o Effectiveness of approach,
- o Project management's role in integrating four key areas of the project: policy, institutions, technology, and resources,
- o Internalization of environmental concerns, replication, and adoption of the approach as national policy,
- o Incremental net benefits,
- o New institutional structures vis-a-vis integration of conservation and market-oriented production,
- o Sustainability of management systems and institutions, and
- o The use of sub-grants as a tool for institution-building (at the resource-user level).

B. Procedure for Evaluation

The scope of work for the evaluation identifies a number of areas to be assessed, as noted above. Most of these are areas which would normally be addressed by a final, performance evaluation--examining how well the project has been implemented and the degree to which its outputs and targets have been achieved. However, some of the issues are those of a management capacity assessment, which would normally be carried out not at the end of--but rather during--a project. As noted in Olsen, *et al.*, 1998, management capacity assessments are conducted to determine the adequacy of management structures and governance processes as these relate to generally accepted international standards and experience. The purpose of a management capacity assessment is usually to improve project design and make adjustments to the internal workings of a project or program. In brief, the scope of work expresses interest gaining insight into the operational aspects of SCOR, which will help the Government of Sri Lanka (GSL), the United States Agency for International Development (USAID), and the International Irrigation Management Institute (IIMI) in designing and implementing future programs more effectively.

The evaluation team was composed of four members, including three Sri Lankans and an American, all with in-depth experience relevant to the evaluation. A brief summary of each team member's qualifications is provided in Annex 2.

The evaluation team:

- o Interviewed project staff; Government of Sri Lanka officials at the national, provincial, and field levels; farmers and resource users; NGOs; and others, as shown in Annex 3;
- o Reviewed project documents, related reports, and other relevant background materials, the most significant of which are listed in Annex 4; and
- o Carried out field visits to Huruluwewa and Nilwala watersheds, visiting field offices, intervention sites, family farms, processing plants, and other relevant facilities.

The evaluation team members identified key topics for exploration and developed lists of key questions for each of a number of key issue areas under each topic. These were used to guide the team during the field visits and interviews. Following field visits, interviews, and document review, the team prepared a first draft for discussion and comment. Based on a review of the draft document at USAID by GSL, USAID, and IIMI representatives, and on comments received from GSL and IIMI representatives, the present final draft was prepared.

II. BACKGROUND ON THE PROJECT BACKGROUND ON THE PROJECT

A. The Places, the Resources, and the People

The pilot sites are very different from each other, especially with respect to agroecological and socio-economic conditions, stakeholder groups and, to a lesser degree, with respect to the institutional context. These differences are highlighted in Table 1. The locations of the two watersheds are shown in Map 1.

1. Huruluwewa watershed.

Huruluwewa watershed is located in the North Central Province, in Sri Lanka's dry zone. The watershed covers 420 square kilometers (see Map 2). The Huruluwewa watershed falls within the administrative districts of Anuradhapura and Matale and is divided into three Divisional Secretary divisions (Galenbindunuwewa, Palugaswewa and Kekirawa. There are 23 *grama niladhari* units (the lowest administrative unit) and 123 villages in the three Divisional Secretary Divisions. The total population is approximately 39,000 persons, with a population density of 93 persons per square kilometer.

As a result of the devolution of power and decentralization of the administration to the provinces, there emerged the Provincial Councils and *Pradeshiya Sabhas* with elected representatives, bringing a new dimension to local government politics. The Huruluwewa watershed comes under the authority of the North Central Province, with its headquarters in Anuradhapura.

Huruluwewa has a typical dry zone climate with about 1200 mm of annual rainfall, most of it concentrated in the *maha* wet season from September to January. The rain scarce *yala* (minor) season some paddy and subsidiary food crops are cultivated.

The Huruluwewa Tank built by King Mahasen (274-301 AD) was in ruins during the colonial period. It was restored to its full capacity by the Government and the Huruluwewa Colonization Scheme was started in 1954. At present the tank has a capacity of 55,000 acre feet. It irrigates 10,000 acres of paddy land (LB: 4000 and RB: 6000) and provides water to 2,400 farm families. There are about 3,000 acres of upland and 200 small tanks. As the water supply to Huruluwewa was inadequate, the Government decided to supplement its capacity by constructing a 22 km feeder canal from the Bowatenna outlet of the Mahaweli System through Kandalama via Yan Oya to Huruluwewa. This canal was officially opened by the Honorable Sirimavo Bandaranaike, Prime Minister, in 1976. For the first few years, the Huruluwewa reservoir benefitted and the tank filled after many years. Then, due to illicit tapping of the feeder canal in the Dambulla area for the cultivation of paddy and high-value crops, the Huruluwewa system received less than 50 percent of the allotted water.

While the feeder canal is administered by the Mahaweli Authority (Ministry of Mahaweli), the Huruluwewa irrigation system comes under the jurisdiction of the Irrigation Department (Ministry of

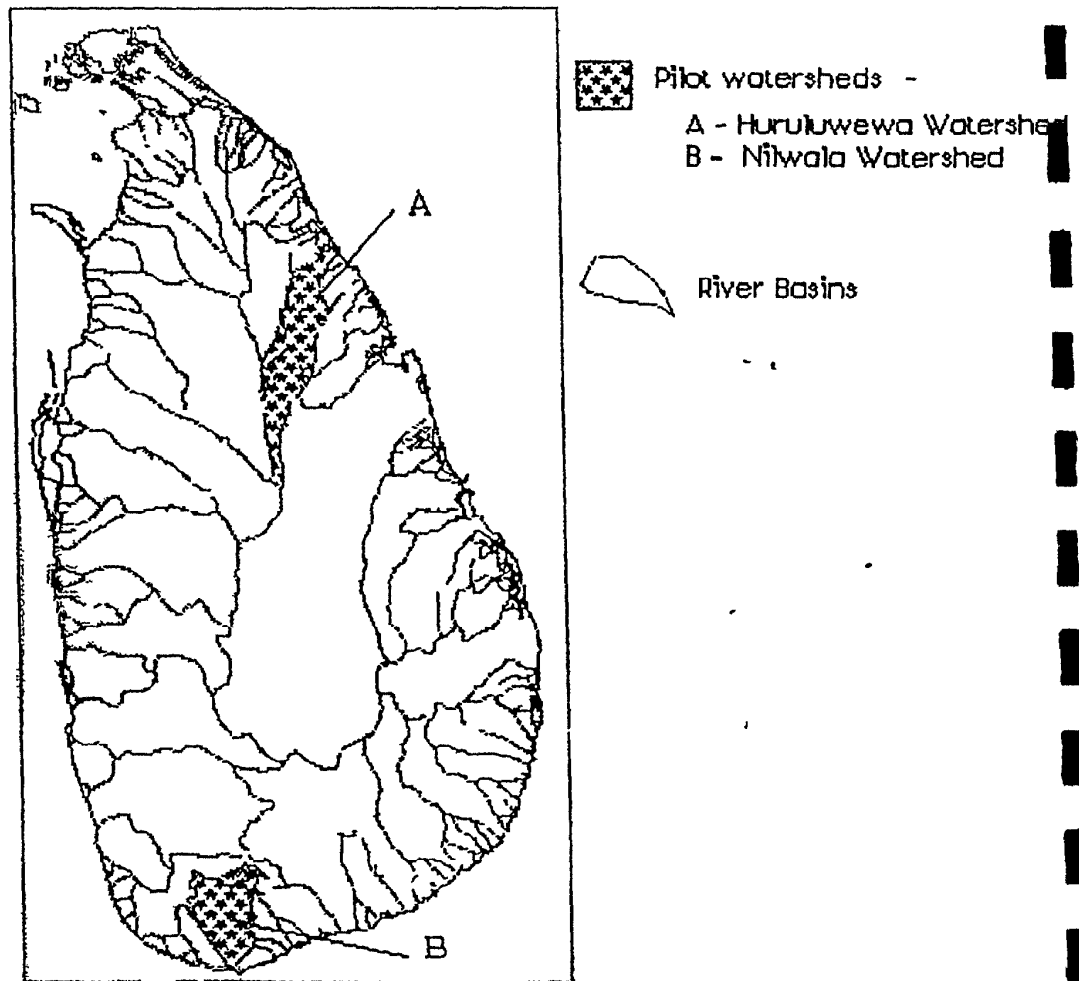
Table 1 Contrast of Pilot Watersheds

<u>HURULUWEWA WATERSHED</u>	<u>NILWALA WATERSHED</u>
Agro-ecological region of North Central Province of the Dry Zone of Sri Lanka	Agro-ecological region of Southern Province of the Wet Zone of Sri Lanka
The average annual rainfall varies from 1900 mm upstream and 1300 mm downstream	The rainfall when the 75% expectancy is about 1500 mm/year to the upper catchment where it is about 3140 mm/y with local averages reaching nearly 4500 mm/y
1200 mm of annual rainfall most of it concentrated in the <i>Maha</i> wet season from September to January	Nilwala has a typical wet zone climate with an annual rainfall of 2000-3000 mm and no extended dry season. The upper watershed from 300-1000 feet about sea level elevation is steeply sloping terrain and intensely cultivated
Catchment reservoirs-Huruluwewa and over 200 small tanks The upper catchment area is 420 sq km	The upper catchment is about 440 km, is steep and the river channel slope averages about 0.25 m/km of river channel slope
A feeder canal from the Mahaweli River diversion provides water to the water deficit Huruluwewa tank	The Nilwala river which drains to the sea in the Southern most area of S L is 70 km long 1462 sq km In the Southern Province
The total population is 39,000 persons or a population density of 93 persons per sq km	The population density is approximately 450 persons per sq kilometer - about 5 times that of Huruluwewa
Inadequate tree cover due to chena encourages soil erosion	About 22% of the upper catchment is under forest and about 2/3 of this is dense protected forest
Falls within 2 districts Anuradhapura and Matale 3 Divisional areas - Galenbindunuwewa Palugaswewa Kekirawa	Falls within one district Matara 4 Divisional areas - Kotapola Pasgoda Neluwa Pitabaddara

Table 1 Contrast of Pilot Watersheds

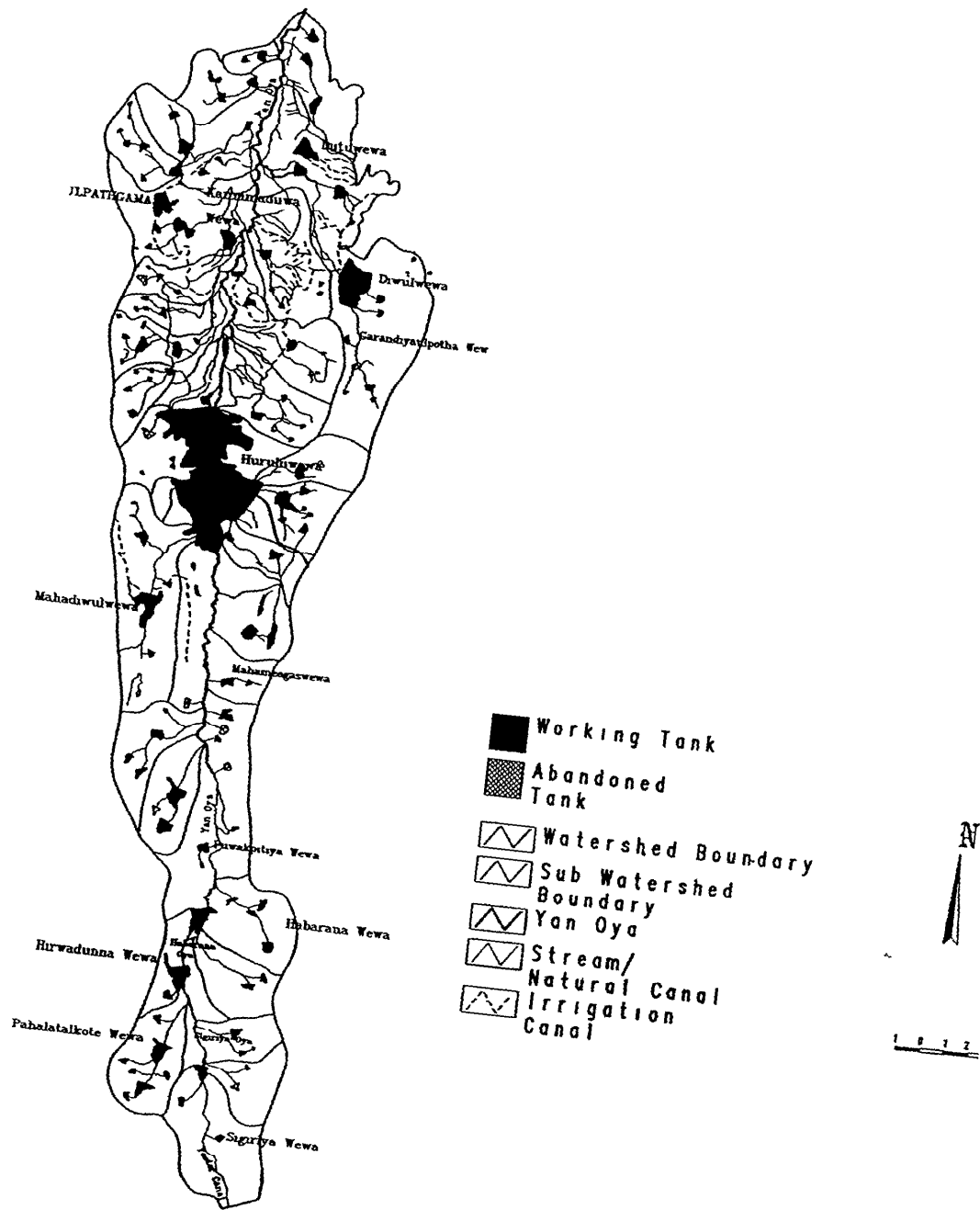
<u>HURULUWEWA WATERSHED</u>	<u>NILWALA WATERSHED</u>
Main land use types	Main land use types
Cropland 43%	Highlands
Paddy 24%	Paddy
Homestead 12%	Chena/scrub
Waterbodies 10%	Dense forest
Scrubland 8%	Homestead
Dense forest 1%	Waterbodies
Open forest 1%	Rock out crops
Important crops grown in the highlands are paddy, soya, onions and vegetables	Important crops grown in the highlands are tea, rubber, coconut, kitul, cinnamon and fruit trees
Resource problems Scarcity, seasonality and variability of water availability	A significant area of the watershed is degraded.
Difficulty in managing rainfed uplands on a sustained basis	
Degradation of forest resources and over exploitation	

Source Selected IIMI/SCOR documents



Map 1 Pilot Watersheds of the SCOR Project

Source IIMI



Map 2 Huruluwewa Watershed

Source IIMI

Irrigation, Power and Energy). The more than 200 small irrigation tanks are administered by the Department of Agrarian Services, and provide seasonal irrigation in the Huruluwewa pilot project area.

The major problems are scarcity of water, impoverishment of the soil, difficulty in managing rainfed uplands on a sustained basis, serious degradation of the diminishing forest resources, and fragmentation of paddy holdings. Income levels are low. It was estimated in 1994 that about 50 percent of the population is below the poverty line, based on the percentage of households which received *janasaviya* (poverty allowance) and food stamps. It is observed that there is poor housing and sanitation on the homesteads. As in other colonization schemes, farmers of Huruluwewa tend to be more dependent on officials, which contributes to the erosion of self-confidence and self-reliance.

2. Nilwala River Watershed

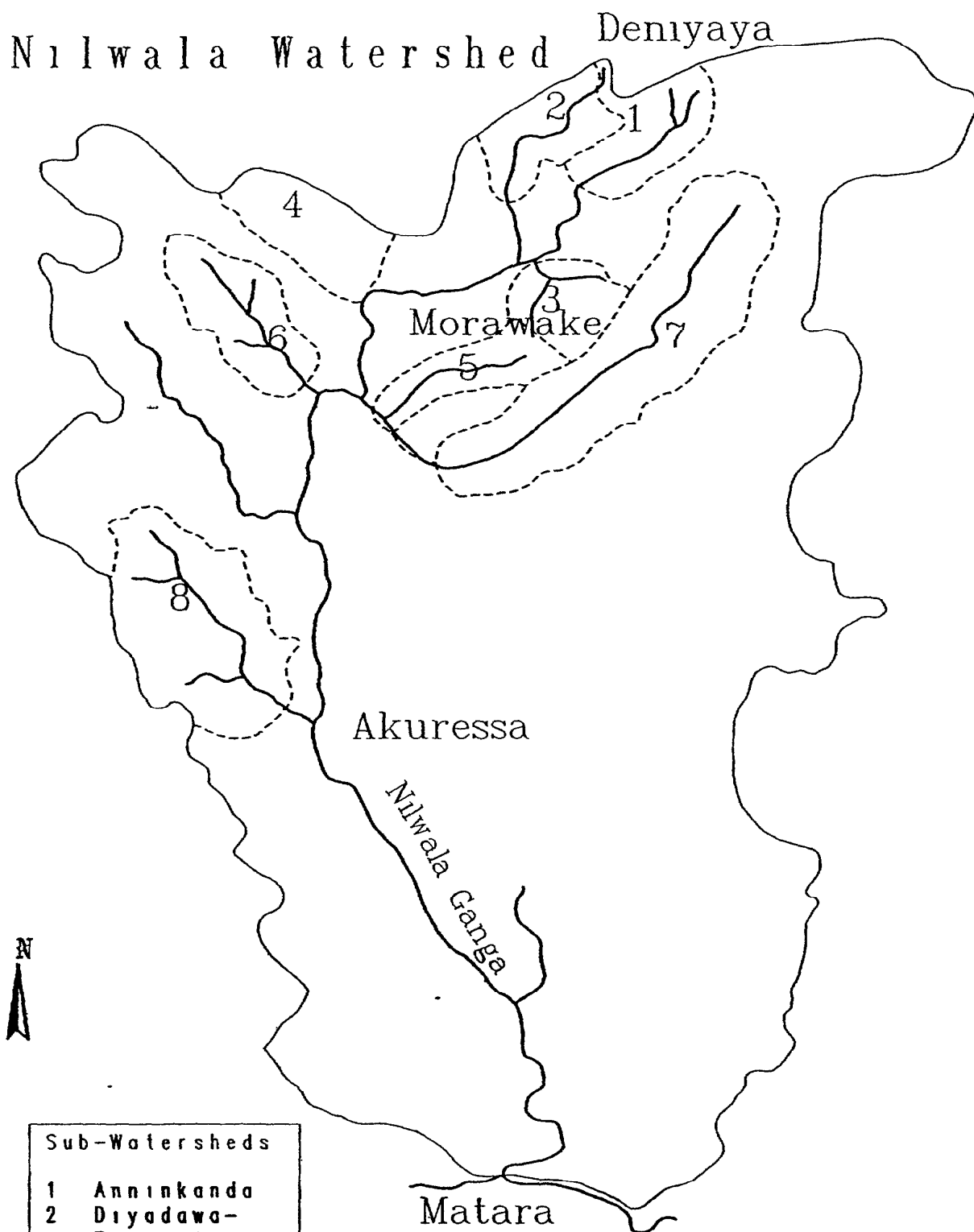
The Nilwala river watershed is the southernmost of Sri Lanka's river basins. It covers an area of 1,020 square km. The river is 70 km long and enters the sea at Matara, the headquarters of the Southern Province. (See Map 3).

The upper catchment of about 440 km is steep and has quite high rainfall. In this part of the river, the channel slope averages about 31 meters per km, rising to a maximum elevation of about 1,050 m. The coastal plain is somewhat smaller. It is quite flat, with about 0.25 meter per km of river channel slope. There is a steep increase in rainfall from the coastal plain, where there is a 75 percent expectancy for about 1,500 mm per year, to the upper catchment, where the expected average annual rainfall is about 3140 mm, with local averages sometimes reaching nearly 4,500 mm. There are no clear indications of trends or change in these rainfall patterns.

Both the upper and lower parts of the catchment are densely populated and are principally under agricultural forms of land use. The Aninkanda Sub-watershed, near the river's source, has a population density of 610 persons/km. For people in the upper catchment, non-agricultural options are few and logistics to reach employment centres such as Matara are difficult.



Land rights are largely private, although there are also substantial state lands. There has been significant encroachment on the state lands, which the state institutions have not been able to prevent. Water rights are generally not clear. Population pressure has led people to base primary economic activities on land resources to which they have not obtained legal title. Large state-owned tea plantations cover substantial portions of the best soils, while small holders cultivate tea and home gardens, often on marginal sites. Land shortage among small holders is acute. About 30 percent of the project area is steeply sloping scrub or forest--mostly state controlled. About 22 percent of the upper catchment is under forest. About two-thirds of this is dense protected forest, which has been under assault mainly around the boundaries. Encroachment by small holders eager to expand their tea land is rapidly depleting the remaining forest cover.

Nilwala Watershed



Sub-Watersheds

- 1 Anninkanda
- 2 Diyadawa-Tenipita
- 3 Horagala
- 4 Milla Ela

-  Watershed Boundary
-  Sub watershed Boundary

The economy is dependent on tea, and of the cultivated crops, tea has grown most in significance in recent times. Considerable income derives from tea smallholdings and, consequently, the standard of living of the people is much higher than in Huruluwewa. The average farmer tends to be more aggressive and more self-reliant.

3. Stakeholders

There are differences in the types of stakeholders in the Huruluwewa and Nilwala watersheds, due to the contrast in geophysical characteristics and historical reasons, which have also influenced economic options, as noted above. As in other parts of the dry zone, there are in Huruluwewa *purana* (old , established) villages and agricultural settlement schemes, i.e., the Huruluwewa colonisation scheme. The major crops are paddy, subsidiary food crops such as maize, and cash crops such as onions, chillies and soya. Most crops are grown under irrigation, with water from the Huruluwewa tank and 200 small tanks. The stakeholders at the village level are the paddy farmers, *chena* cultivators, livestock farmers, food processors, and traders. Also, village level officials, *grama niladari* and *samurdhi niyamakas* take part in many activities. Women assist the men in agricultural pursuits.

On the other hand, Nilwala is mountainous with plenty of water in both seasons. The main agricultural activity is the cultivation of tea in small holdings, with some paddy irrigated by weirs (anicuts), and some cinnamon, vegetables and fruits. Almost all the people are in one way or the other connected to tea small holdings and *kitul* tapping. The major stakeholders at the village level are tea farmers, who may also be paddy farmers and vegetable farmers, tea pluckers, tea leaf transporters, factory workers, and *kitul* tappers.

The stakeholders at the divisional level are also different in each watershed. While the Divisional Secretaries in both areas have similar responsibilities, the infrastructure and the services in the two places are different. In Huruluwewa, the officials are mainly from the Departments of Agrarian Services & Irrigation, Agriculture, and Forestry while in Nilwala officials represent the Tea Smallholders Authority, Plantation Industries, Forestry, and Agriculture.

The political stakeholders at the Divisional level are the members of the *Pradeshiya Sabha*, with the Divisional Secretary serving as ex officio Secretary of the *Sabha*. The review and coordination function at the Divisional level is done by the Divisional Secretary who chairs the Coordinating Committee meeting.

At the district level in both watersheds, key officials are those of the Land Commissioners Office and the Departments of Agriculture, Agrarian Services, and Forestry. In Nilwala, the Tea Small Holders Development Authority is also active. The key stakeholders at the provincial level are the Chief Minister, Provincial Counselors, and the Provincial Secretary. The Provincial Steering Committee (PSC) plays a dynamic role in the SCOR activities and coordination.

At the national level, key stakeholders include USAID, the Ministries of Irrigation, Agriculture, Forestry, Environment, and Plantation Industries, and IIMI. The National Steering Committee (NSC) for SCOR consists of senior representatives of the relevant Ministries, USAID, IIMI, and the SCOR Project. Table 2 shows the various project stakeholders.

B. Summary Description of the Project

The Shared Control of Natural Resources (SCOR) Sub-Project of the Natural Resources and Environmental Policy Project (NAREPP) was an innovative US \$4.86 million initiative carried out from March 1993 through September 1998 by the International Irrigation Management Institute (IIMI), under a Cooperative Agreement with USAID and the overall guidance of a Project Steering Committee led by the Ministry of Irrigation, Power and Energy of the Government of Sri Lanka (GSL). Its purpose, as revised following the Mid-Term Evaluation in 1995, was to assist the Government of Sri Lanka (GSL) to identify, develop, and field test models for increasing the sustainable productivity of natural resources--mainly land and water--in a watershed context...[SCOR pursued] this purpose by assisting Sri Lanka to intensify sustainable productivity of land and water resources within selected watersheds while conserving the physical, biological, and social environments through novel management models and shared control by local user groups and the government involving formal agreements and joint management.² Key features of the models to be developed were soil and water conservation and management, changes in cropping patterns and practices, natural resource tenurial security, community participation in resource use planning and development, and state-user partnerships for the management of natural resources.

C. The Evolution of the Project

The key junctures in the evolution of the project were four:

- (a) The initial design,
- (b) The original program description of the USAID/IIMI Cooperative Agreement,
- (c) The Mid-Term Evaluation (MTE) and the revised program description following the MTE, and
- (d) The final year (phase-out) program.

²USAID/IIMI, 1995. SCOR Cooperative Agreement, Modification [to the Program Description] No. 4, December 1995.

Table 2: Project Stakeholders

National Level

IIMI
 USAID
 President and all Ministers
 Members of Parliament
 Ministries - Irrigation, Agriculture Forestry & Environment, Plantation Industries

Department of Agriculture
 Forest Department
 Department of Agrarian Services
 Tea Small Holders Authority
 Department of Water Resources
 Land Commissioner's Department
 Irrigation Management Division
 National Steering Committee

HURULUWEWA

Provincial level

Provincial Council, NCP
 Chief Minister
 Ministers
 Chief Secretary
 All Departments
 Prov. Steering Committee

District Level

District Secretary
 All District Heads

Divisional Level

Divisional Secretary
 Agricultural Instructor
 Colonization Officer
 Technical Asst I/D
 Divisional Office ASD
 Forest Officer, Dept. Of Forest

Village Level

Paddy Farmers
 Chena Cultivators
 Dairy farmers
 Agricultural labourers
 Agricultural workers
 NGO
 Villagers
 Cooperatives
 Vegetable cultivators
 Onion & Chili Cultivators

NILWALA

Provincial level

Provincial Council, SP
 Chief Minister
 Ministers
 Chief Secretary
 All Departments
 Prov. Steering Committee

District Level

District Secretary
 All District Heads
 Tea Small Holders Authority

Divisional Level

Divisional Secretary
 Agricultural Instructor
 Managers, Tea Estates
 Tea S.H. Inspector TSHA

Village Level

Tea Farmers
 Tea Pluckers
 Paddy Farmers
 Dairy Farmers
 Estate Labourers
 Kitul tappers
 NGO
 Tea factory workers
 Cooperatives

Changes in the proposed outputs of the project design at the project's key junctures, including the MTE, are shown in Table 3, which is discussed further, below.

The initial project design was consulted among a broad range of potential stakeholders, especially government agencies, who were involved at various levels. More limited consultation was carried out at the field level. The subsequent changes in the project design were consulted less broadly, mainly between USAID and IIMI, supplemented by discussion at the National Steering Committee level. Specific design changes were generally proposed by IIMI, in response to three factors: its field experience, the MTE, and finally, USAID's decision not to extend the project, as many had hoped.

The overall purpose of the project--to sustain productivity through shared control of resources-- was generally understood by project staff, collaborating staff of the involved line agencies, and farmer leaders. However, SCOR, line agency staff, and others varied in their interpretation of the specific terms of the project purpose. For example, some line agency staff understood shared control to refer most importantly to integrating the work of diverse line agencies, especially as this related to interventions and services in subwatersheds. Others understood that the project sought more fundamental increases in the degree of control resource users themselves exercise. Similarly (and reasonably), most farmers understood the purpose only in terms of the specific initiatives in which they were involved. Outsiders to the project saw in it still other objectives. For example, a recent 1997 review of research activities of 11 CGIAR centers related to improved water utilisation in a watershed perspective noted that Except for the IIMI SCOR project, it seems that no project [of the five watershed projects and dozens of related research activities reviewed] address the SWIM7 focus of watershed management with the explicit aim to improve the amount or quality of downstream water.³ (In fact, most of SCOR's interventions, however, were managed on a sub-watershed basis. Nonetheless, the observation makes clear that SCOR has been at the cutting edge of international efforts to understand and improve watershed management.)

The MTE made a number of useful recommendations designed to increase SCOR's effectiveness and efficiency. Most important of these were the recommendations which aimed to help SCOR focus better, concentrating its limited resources on areas where results were most likely to be achieved, and consolidating its early successes in two pilot watersheds...to provide replicable models for local government and the NGO community implementation.⁴ The Project Evaluation Summary based on the MTE also noted a tendency to assess SCOR's worth by the number of hectares covered...[which] may distract attention from SCOR's tasks as an action research and policy reform project, which were fundamental to program sustainability of SCOR-supported innovations. A brief perusal of Table 3's assortment of outputs reveals that the MTE's recommendations were largely ignored until the final year of the project.

³Van-de-Giesen, [1997?], p. 2. This observation appears to have been based on interventions at Huruluwewa which were not only aimed at in situ conservation but also at downstream improved dry season water availability and water quality. (*Ibid.*, p. 3)

⁴USAID, 1995, Project Evaluation Summary.

Table 3: Evolution of Priority Outputs

Original Outputs for first 2 years (1993)⁵	MTE Recommendations (1995)⁶	Post-MTE Outputs (1995)⁷	Post-MTE: Specific Targets (1995)⁸	Final Year Work Plan: Specific Targets (1997)⁹
Purpose and outcome level indicators				
		25,000 users implementing conservation technologies on 25,000 has.	--20,000 has under improved techniques --\$2.0 m. invested by resource users in environmentally sound practices --Two government policy decisions initiated --3,500 has under new agreements --15,000 farm households using improved techniques	18,202 has under improved techniques --\$1.0 m. invested by resource users in environmentally sound practices --Six policy/procedures, organizational changes exacted and adopted --522 has under agreements between GSL and user groups --12, 689 farm households using improved techniques
Forming, expanding, and strengthening resource user groups (User groups for local control)				
150 user groups identified, organized, and/or assisted	Target lesser number of groups; develop model for line agency use; IIMI change from implementor to advisory role	750 user groups ... to take joint responsibility through formal agreements	550 user groups organized/assisted to take joint responsibility; Groups/organizations promote planning and coordination in pilot watersheds	67 user groups organized/assisted to take joint responsibility
15-20 user organizations; 1 to 2 sub-councils	Ensure such groups are represented on WRMTs		50 organizations, 6 to 8 sub-councils, 1 to 3 councils,	

5.IIMI, 1993a (Original Program Description)

6.DAI, 1995, Mid-Term Evaluation

7.USAID and IIMI, 1995, Program Description (Modification No. 4 to the Cooperative Agreement)

8.USAID and IIMI, 1995, Table 4.2.1 of the Program Description (Modification No. 4 to the Cooperative Agreement)

9.USAID and IIMI, 1997, Work Plan and Output... (Modification No. 9 to the Cooperative Agreement)

Original Outputs for first 2 years (1993)⁵	MTE Recommendations (1995)⁶	Post-MTE Outputs (1995)⁷	Post-MTE: Specific Targets (1995)⁸	Final Year Work Plan: Specific Targets (1997)⁹
organized/ assisted; 20 conferred with legal status and powers			organized/assisted to take joint responsibility	
600 user group members trained; 75 user organization representatives; 8 representatives of user councils; 40 for training abroad	Develop structured training modules and materials; develop network of master farmers	6,000 user group members trained; 40-50 officers in user group councils or associations trained; Training materials prepared	Training opportunities provided for representatives: 20,000 for user group 450 for organization 40 for councils 25 for training abroad	17,919 training opportunities provided to representatives of user groups, NGOs, and the private sector in participatory resources management
100 to 150 small grants to user groups made and invested into common group assets		500 small grants made and invested into common group assets	450 small grants made (directly by SCOR or through organizations/councils/companies)	
Tenure rights (Securing shared control of resources by user groups through formal agreements)				
Regulatory, procedural, or organizational changes enacted to increase shared control	Make the (sometimes informal) arrangements statutory ASAP, to permit project to help stabilize operational procedures	Innovative tenure arrangements demonstrated; analytic papers/reports on regulatory, etc. changes	50 user organizations conferred with legal status and powers; Institutional mechanism to coordinate and support resource management operational at provincial and national levels	50 user organizations conferred with legal status and powers
Land leasing/usufruct processes accelerated, reducing processing time by 50 percent; 2 production companies intensifying production and linked to markets		Favorable resource tenure status covering 20,000 has. Analytic papers/reports on tenure; Workshops; Land-leasing/usufruct processes accelerated to facilitate establishment of 5-10 production companies and 150 rural commercial	Land-leasing usufruct agreements issued for establishment and functioning of : (a) 5 production companies (b) 100 commercial activities	5 land/leasing agreements issued for private commercial activities

Original Outputs for first 2 years (1993)⁵	MTE Recommendations (1995)⁶	Post-MTE Outputs (1995)⁷	Post-MTE: Specific Targets (1995)⁸	Final Year Work Plan: Specific Targets (1997)⁹
		activities through formal agreements		
Demonstration of the benefits of authorizing user group, joint management, and consolidated land management/production systems	Ensure sites are representative; Carry out economic analysis (e.g., rigorous benefit/cost analysis ; effects of incentives); Articulate incentive strategy and test assumptions before beginning replication efforts	Demonstration of benefits in 5 small tanks; Project will evaluate effectiveness of new techniques, w/ special reference to costs/benefits for users and social acceptability;		
Improving government, NGO, and commercial support to and relationships with user groups (Sustainable institutional mechanisms)				
80 officials trained in local planning and user group collaboration	Develop strong modules to help agencies help farmers in selection of best practices	80 officers trained in local planning and user group collaboration; Set of training materials prepared for their use	80 officials trained in local planning and user group collaboration; short study tours abroad offered to 31 officials	420 officials trained in local planning and user group collaboration
8 NGOs and firms providing support	Assist agencies and NGOs to replicate a minimum-cost package of planning, conservation practices, and tenure	8 NGOs and firms providing support; Set of training materials prepared for their use prepared	15 NGOs and firms providing technical, managerial, and commercial information to user groups	15 NGOs and firms providing technical, managerial, and commercial information to user groups
Improving integrated planning, information flow, and inter-organizational linkages				
Improved methods/tools for multilevel integrated planning/coordination	Explore the best institutional arrangements for management of such efforts; Simplify tools (e.g., mapping) for resource users	Improved methods/tools; Jointly-produced annual management plans (User groups/NGOs/ Government)	Improved methods/tools developed/applied	
Research studies, participatory planning, and monitoring and evaluation				
Improved monitoring system designed	Develop smaller set of benchmarks and indicators, particular attention to tenure, land productivity, and socioeconomic factors; Improve documentation of experience with	Assessment of project based on specific indicators; Illustrative list of 29 research studies; Improved resource information and monitoring system	25 research studies completed on natural resource issues; Improved resource information and monitoring system designed	25 research studies completed on natural resource issues

Original Outputs for first 2 years (1993)⁵	MTE Recom- mendations (1995)⁶	Post-MTE Outputs (1995) ⁷	Post-MTE: Specific Targets (1995)⁸	Final Year Work Plan: Specific Targets (1997)⁹
	innovations; Report regularly on issues, proposing solutions	designed		

As shown in Table 3, SCOR's priority outputs were organized under five clusters of activities and outputs, which served as the main framework to structure the project. However, the project design includes a number of other orienting frameworks, one of which could have been far more useful in focussing on SCOR's objective to move its innovative methods and/or mechanisms from a project to a program mode. The Step-wise Implementation Schedule lays out a framework of four key stages and a proposed time-frame for each:

- (a) Planning and organizing,
- (b) Experiments and replication,
- (c) Consolidation, and
- (d) Institutionalization and spread effects.

Although the schedule was prepared at the time of the original design, it was not elaborated upon in detail in either of the first two program descriptions (1993 and 1995), and only somewhat more clarified in the final work plan (1997), as follows:

Stage 1. Establishing a database, analysis of current situation and planning...for interventions,
 Stage 2. Action research to confirm the viability of interventions and mechanisms for provision of support for conservation and production activities,
 Stage 3. Consolidation of tested interventions through the activities of catalysts, and
 Stage 4. Assistance to resource user groups; government and other agencies to institutionalize tested watershed management methodologies.¹⁰

No benchmarks or outputs were developed for this framework.

Conclusion

o In as complex an undertaking as watershed management, the stepwise schedule provided a useful framework for ensuring that progress towards key sustainability objectives was made. That it, or some other framework for reviewing progress through a set of benchmarks, was not used is regrettable. Disciplined use of such a phase-oriented framework may have helped the project prepare better for achieving its objective of moving key activities from a project to a program mode.

Recommendation

o Watershed management decision makers, project managers, and researchers may find it useful to review experience and approaches used in coastal resource management projects, which are similar to watershed management initiatives in that they involve complex, interdependent systems, deal with upstream-downstream linkages, and involve a diversity of stakeholder interests and conflicts. Annex 5 draws from such experience to provide an illustrative list of benchmarks that may be useful in assessing incremental increases in watershed management capacity.

¹⁰USAID and IIMI, 1997, Modification No. 9 to the Cooperative Agreement.

III. ACHIEVEMENT OF PROJECT OBJECTIVES AND TARGETS

SCOR made significant and innovative contributions to achieving its overall objectives and to building institutional capacity for achieving its output targets. In general, SCOR did not achieve the ambitious and unrealistic output targets of the original design and the later Modification No. 4 to the Cooperative Agreement. The National Steering Committee finally approved considerably changed targets in December 1997, which either have been, or are likely to be, achieved (see Table 4).

SCOR contributed to policy changes which created openings for positive changes in watershed management. SCOR also helped develop innovative organizational forms and mechanisms which could take advantage of these openings. It is not clear that these contributions to institutional capacity are yet strong enough to be sustained.

Research studies addressed only a few of the ten or so hypotheses proposed in 1995 (see also Chapter IV, below). The rigorous cost-benefit analysis of SCOR interventions proposed by the MTE was not carried out. The studies carried out were not widely shared and discussed. The proposed monitoring system and the common ... program and database which was to serve both research and monitoring was only partially implemented. It was not used to inform project management decisions until very late in the project. In part, this may have been a result of the unnecessary linking of project monitoring with the research data system. The team was informed that the research system generated vast amounts of data, most of which was never used. On the other hand, the monitoring indicators that were finally used to measure progress (see Table 4) didn't require much data at all. An example of the gap between research and monitoring which helped prevent the problem from being addressed was that, even within the project team, researchers and field staff did not meet together to discuss observations until the final ten months. Those discussions, however, proved extremely valuable in the redirecting of activities which took place at that time.

SCOR's monitoring was to be a rigorous and continuous process which would serve as a feedback/correcting mechanism for project implementation, focused both on activities or inputs as well as the project's achievement of specific objectives (IIMI, 1993, p.19). It was to include methods ranging from participatory self-evaluation to the use of geographic information systems. The activity data base was to provide information on four basic themes:

- (a) Formation and strengthening of user groups,
- (b) Shared control through state-user partnerships through formal agreements,
- (c) Support to user groups by government, NGO, and private sector organizations, and
- (d) Improved information, linkages, and planning of watershed resources.

Table 4 Achievement of Targetted Purpose and Output-Level Indicators

Project purpose level indicators

Strategic level Indicator	Unit	Target Up to 30 Sept. 1998	Total To date
1 Targeted hectares under improved production and protection techniques,	Ha	18 202	14,606
2 Value of targeted investment by the resource users in environmentally sound production practices	\$(M)	1 0	1 73

Performance by program outcome level indicators

Outcome Level Indicator	Unit	Target to 30 Sep 98	Achieved To date
1 Targeted land area covered by agreements between GSL and user groups (Extent now under protection and production practices expecting user rights)	Ha	522	503
2 Farm households using improved environmental techniques	#	12 689	12 615

Project Purpose Level Indicator	Unit	Target to 31 Sep 98	Achieved To date
1 Number of natural resources groups operating	#	67	44
2 No of policy/procedures, organizational changes exacted and adopted	#	6	3

Project Output Targets/Performance	Target to 31 Sep 98	Achieved To date
1 User groups organized/assisted to take joint responsibility for management of land and water resources	67	44
2 Number of new commercial activities supported by linking to markets	160	138
3 Land leasing/usufruct agreements issued for establishments and functioning of production companies and commercial activities	5	2
4 Training opportunities provided to representatives of resource user groups NGOs and other private sector organizations in participatory natural resources management	17 919	17 231
5 Number of officials trained in local level planning user groups formation support and collaboration	420	430
6 Number of user organizations conferred with legal status and powers	50	85
7 Number of NGOs and private sector agencies providing technical managerial and commercial information to user groups	15	27
8 Research studies completed on natural resources issues	25	19

These themes were later changed to a set of five, as described below. Monitoring and evaluation during the project was to concentrate on performance at the interface between user groups and the government sector... [while including] necessary oversight of project activity at other levels .¹¹

Following the MTE, the description of the monitoring system was revised--first in the post-MTE Program Description (CA Modification No. 4) and six months later in the May 1996 Work Plan for Phase II. CA Modification No. 4 stated, It should be noted that SCOR M&E database is not separated from its research database , with common data collection for both M&E indicators and those for special research studies and in-depth analyses.¹² The result was a far more elaborate system, well-organized on paper but, like the project, with many moving parts, often dependent on each other. The very design made it difficult to ensure the continuous flow of information , which it was intended to create and which it had correctly seen as essential to enrich[ing] the SCOR participatory process. ¹³

Monitoring was also affected by a lack of clarity in project objectives. As noted earlier, project objectives were stated differently at different times and places. The objectives themselves provided a succinct general statement of the direction in which the project intended to go. However, they did not provide a concrete idea of the results expected, and left several issues unclarified, most importantly that of institutional sustainability.

The major output of the monitoring activity was to be the assessment of SCOR Project based on specific indicators . These indicators were based mainly on the outputs identified under five (originally four) key activity areas identified in the Cooperative Agreement's Modification No. 4, as follows:

- o Research Studies, Participatory Planning and Monitoring and Evaluation,
- o Integrated and Participatory Planning,
- o Strengthening User Groups,
- o Establishing Tenure and Use Rights, and
- o Improving government, NGO, and commercial support to and relationships with user groups.

The evolution over the course of the project of planned output targets under each of these activity areas is shown in Table 3 (see Chapter II).

¹¹IIMI, 1993a, p. 28.

¹²USAID and IIMI, 1995, p. 23.

¹³ IIMI, 1996.

IV. EFFECTIVENESS OF SCOR'S OVERALL APPROACH. EFFECTIVENESS OF SCOR'S OVERALL APPROACH

A. Overview

SCOR's overall approach had a number of cross-cutting elements. Most importantly, SCOR worked to develop and apply:

- o An integrated watershed approach, based on interdisciplinary understanding of changing biophysical, socio-economic, and political systems.
- o A participatory approach, promoting broad, multi-leveled participation and collaborative relationships among a range of government agencies, local groups, non-government organizations, and individuals.
- o An approach which balances conservation and production, protecting key functions of natural systems upon which productivity depends. Similarly, SCOR sought to apply an approach which balanced the economic well-being of present resource users without taking from future generations.
- o A learning approach, through action research based on natural and social sciences, filling important gaps in our understanding, e.g., of the impacts of alternative decisions.

SCOR's use of these overall approaches is assessed in the following sections of this chapter. The following Chapter V assesses SCOR's use of specific methods based on these overall approaches. Experience from Sri Lanka¹⁴ and elsewhere in the world suggests that a fundamental factor in sustaining the results of a participatory, learning approach is the development of models which fit well with (a) opportunities and resources in specific places and (b) the capacities, and objectives of specific people (whether farmers or officials). Participatory approaches offer an opportunity to develop capacity for improved resource management decisions through moving responsibility (and thus needed hands-on learning) for both resource management and program decisions much closer to the level of day-to-day resource use.¹⁵

Conclusion: SCOR did not systematically apply key, well-accepted, principles to help develop sustainable processes (e.g., the principle of ownership in its efforts to strengthen user groups). It appears, rather, to have stumbled across them. As a result, SCOR applied them effectively in only a partial range of its activities. (Similarly, it did not test such principles through its research.)

B. A Watershed Approach

The scale of the project design was the whole watershed. The focus on the watershed as a basic planning, coordinating and implementation unit was a unique feature of the SCOR Project. Overall planning by the project team took into account the watershed level, but was most intensive at the level of the administrative divisions, in collaboration with line agency staff, and at the community level, in collaboration with farmers. In Nilwala, planning was carried out at the sub-watershed level in

¹⁴See, for example, Norm Uphoff's account of experience in Gal Oya (Uphoff, 1996).

¹⁵Devres, 1995.

four sub-watersheds. The scale of most intensive analysis by project implementors and the scale of field implementation itself was at the sub-watershed level and below.

Implementation could have been hampered by the fact that the administrative boundaries were not the same as the watershed boundaries. By focusing on the sub-watershed level for implementation, many of the difficulties which might have arisen were avoided.

Despite the watershed focus, and the importance given participation in planning and project documents, little research was directed at the complex socio-economic context on a watershed scale. For example, specific relationships between upstream and downstream costs and benefits were not well defined and addressed.

Conclusions

o The complex and interrelated dynamics of watershed management made it both difficult and essential for SCOR to maintain focus and ensure that resources (especially those most precious of resources--human imagination and attention) were concentrated effectively over the vast range of problems and opportunities. SCOR was only partially successful in doing so.

C. An Integrated, Collaborative Approach: Participatory Planning and State Agencies

1. The concept.

The objective of the integrated approach to planning was to develop the capacity of the provincial administration, divisional secretaries, line departments and user groups to transform the strategy of development from a project mode to a program mode. As noted in the previous section, although the watershed was considered the basic unit of integrated and participatory planning, SCOR adopted the sub-watersheds as component units of the watershed to facilitate the emphasis on integrated and participatory planning for land and water management.

As mentioned in the overview to this chapter, increasing the users share of control over natural resources through participatory group action and their active participation and collaborative planning in making management decisions is widely accepted as an approach towards improving management of these resources. Interventions aimed at improving natural resources management through local control have been found to yield high returns. For example, enhanced group action by the users and participatory management of irrigation have resulted in increases in water use efficiency and crop yield in many irrigation systems.

Integrated and participatory planning is an important concept running throughout the SCOR strategy. The term integrated refers to taking into account appropriate hydrological, organizational and socio-economic linkages between the upstream and downstream areas of a watershed to strike a proper balance between sustainability, productivity, profitability and equity of land and water resources use. Integrated and participatory action aims to increase the user's share of control over natural resources through group action and their active participation in decision making.

2. Organizational Structure

a. Catalysts and the resource user groups.

At the grass roots level the project is being implemented primarily by user groups with the help of catalysts designated Institutional Organizers. The groups are small ranging from 5 to 10 persons and the type of special activities differ in each watershed. In Huruluwewa it is

homestead development, animal husbandry, income generating activities for women, conservation farming, fruit cultivation, goat farming, nurseries and agriculture based groups. In Nilwala groups are formed for mini hydro schemes, floriculture, stream reservation development, home gardens, agro-forestry, *kitul* treacle collection.

b. Sub-Watershed Resource Management Team.

The Sub Watershed Resource Management Team (SWRMT) is made up of the catalyst (coordinator), Agricultural Instructor, *grama niladhari*, Technical Assistant, other village level officers and farmer representatives. The Team is responsible for planning, and implementation of sub-watershed activities.

c. Watershed Resource Management Team (WRMT)

A multi-disciplinary team consisting of IIMI-SCOR professionals/catalysts, *grama niladhari*, Colonization Officer, Agricultural Instructor, Tea Inspector, other village level officers and farmer representatives form the Watershed Resource Management Team (WRMT). The WRMT is chaired by the Divisional Secretary. The Team is responsible for planning , monitoring and evaluation of watershed projects.

d. Provincial Steering Committee (PSC)

The Provincial Steering Committee(PSC) are made up of Provincial and District Level officers of the Departments of Irrigation, Agriculture, Forestry, Land Commissioner, IIMI/SCOR professionals, Tea Small Holders Authority, Coconut Board and Representatives of Farmer Companies & Farmer Federations. The PSC is chaired by the Provincial Secretary.

e. National Steering Committee (NSC)

The National Steering Committee(NSC) is the apex organization, consisting of all heads of Departments involved in SCOR activities. The NSC is responsible for the planning, review and coordination of SCOR Project activities. An organization chart is shown as Figure 1.

3. Inputs and Activities

The SCOR project adopted the sub watershed as the basic unit of integrated and participatory planning. The selected sub watersheds are contiguous areas of manageable size within the main watersheds, each having an ecological, socio-economic, and environmental features similar in all respects to the main watershed.

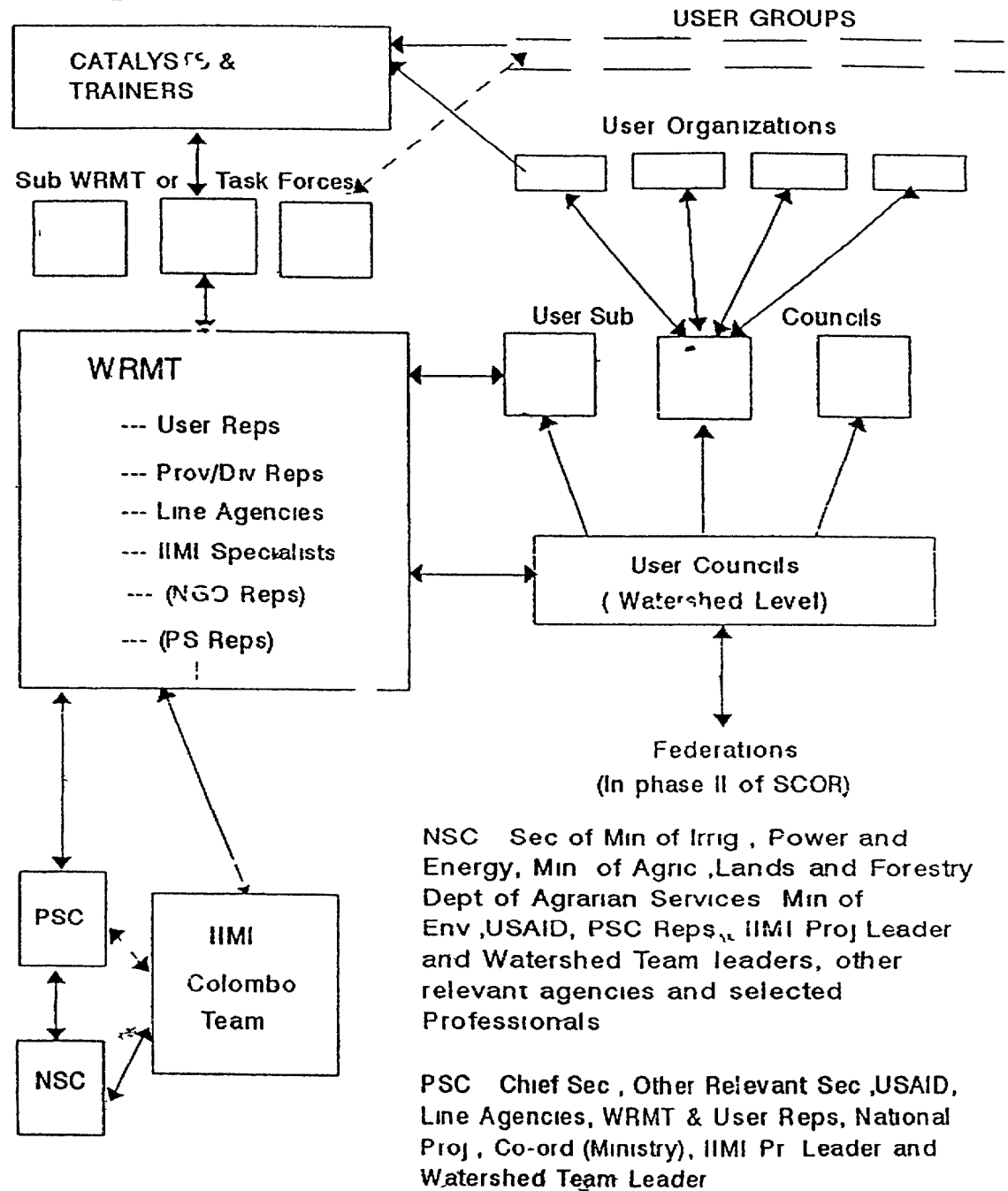
(a) The selection of the sub-watersheds

The SCOR Project adopted the following criteria for the selection of sub-watersheds:

- o Continuous part of a tank cascade system
- o Intensity of resource degradation
- o Man power availability
- o Potential for improvement
- o Low income levels of the community
- o Proximity to former selected sub watersheds
- o Demand of the resource users

The sizes of the sub-watersheds range from 75 ha to 600 ha. In Huruluwewa watershed there are 28 sub-watersheds, of which 6 were selected as focal areas while in Nilwala watershed there are 8 sub watersheds and 4 focal areas as follows:

SCOR Project Organizational Structure



Legend

WRMT - Watershed Resources Management Team

PSC - Provincial Steering Committee

NSC - National Steering Committee

PROV - Provincial

Div - Divisional

REPS - Representation

PS - Private Sector

Figure 1 - SCOR Project Organizational Structure

- o Huruluwewa Watershed: Puwakpitiya, Mahameegaswewa, Mahasengama, Garandiyaulpotha, Tract 6, and Methgama focal areas.
- o Nilwala Watershed: Aninkanda, Diyadawa, Horagala, and Milla Ela focal areas.

(b) Preliminary Survey and Awareness Creation.

The first activity of the Sub-Watershed Task Force was to carry out a participatory assessment of:

- o Present land and water use patterns,
- o Capabilities of resource user groups and support services,
- o Socioeconomic status of resource users,
- o Condition of the resource base and its potential for development.

In each sub-watershed, participatory appraisal and resource uses and resource using mapping was carried out by the Sub-watershed Task Force. The catalysts took the lead role in preparing the map while the other members of the group helped in identifying and mapping the physical features, natural and human resources, land holdings, consultation with users and providing information.

This team of officers, catalysts and farmer leaders formed the Sub Watershed Resource Management Team like their counterparts - the Watershed Resource Management Team (WRMT) have direct links with the Project and Project Steering Committee. Links have also been established at the level of the Divisional Secretary, Pradeshiya Sabha (Divisional Council) and the Palath Sabha. Cooperation has also been sought from politicians through the Pradeshiya Sabha. Through seminars and workshops both at Huruluwewa and Nilwala watersheds the political leadership have been an orientation to the SCOR Project.

c. Participatory rapid mapping, survey and data base development

The steps followed in rapid mapping, survey and data base development in sub-watershed focal areas were as follows:

- o Preparation by the group of a map of the sub-watershed, indicating individual land holdings, land use patterns, type and quality of vegetation, water use, drainage lines, irrigation methods etc.
- o Development of a data base including basic data on those living in the watershed, ownership and tenurial patterns, cropping patterns and intensities, slope category, degree of soil erosion, conservation practices in use, characteristics of production and productivity, and constraints to production and protection.
- o Preparation of a baseline of resource use patterns, using the map and data base.
- o Sensitization of resource users and officials of relevant government officials.

The Sub-Watershed Resource Management Team was given a map at 1:30,000 scale with landmarks, roads, and streams for guidance. The groups collected data and mapped each land plot of a subwatershed. The map was used for participatory planning of resource management of that

subwatershed. Land and water use as well as other information collected through the participatory mapping exercise was incorporated into the SCOR spatial data base, using geographic information system (GIS) computer technologies. This was repeated for selected sub-watersheds. For example, Annex 6 shows pre-project land use (as of January 1994) of Mahameegaswewa village.

The MTE noted that SCOR's land use mapping system appears on the surface to be a computerized system depending upon sophisticated methods and technology. Fortunately this is not really the case...SCOR-IIMI can use the time remaining in the project to experiment with simplified ways of producing resource user maps. These are essential tools of the SCOR approach and do not rely upon sophisticated computer technology. It is important that users realize this and learn the basic mapping skills mastered by the SCOR catalyst. 16 As SCOR's present Project Leader related to the team, this had unfortunately still not occurred by the time he assumed responsibility some years later.

4. Impact /Outcome

The village leaders of the 6 Sub-watershed Focal areas in Huruluwewa watershed and the 4 Sub-Watershed Focal areas of Nilwala, with the local officers and the catalyst prepared an action plans, which included a Project Proposals for mini grants. For example, the pattern of development for Mahameegaswewa is shown in Annex 6, as of February 1995. Other activities include *Gliricidia sepium* as hedge, growing seasonal cash crops and perennials between bunds in the uplands, increasing soil moisture retention using mulch, home garden development (especially by farm women), integrated pest management (although the team did not come across this in the field), and organic farming. Novel state-user partnerships in land and water resources use have been arranged.

Land and water use as well as other information collected through the participatory mapping exercise have been incorporated into the SCOR spatial data base using the Geographic Information System (GIS). Unfortunately, the system appears to not have been applied by resource users and managers as an aid to their decision-making.

All sub-watershed focal areas were given grants for mini-projects, as described in more detail in Chapter V, Section C. For example for the Mahameegaswewa sub-watershed in Huruluwewa, a participatory resources management "mini-project" was formulated with an investment of Rs. 1.2 million (about US \$24,000). New commercial enterprises and conservation practices in a typical sub-watershed include cultivation of medicinal plants, fruits and vegetables in *chena*, stabilizing cropping patterns, contour bunds to cover the entire area, and water harvesting techniques.

Several mini-projects of this nature were implemented in both pilot watersheds. In Nilwala it was observed that deforestation and inappropriate hill side cultivation in the upper Nilwala have resulted in reduced water availability in the dry season, erosion, sedimentation and declining water quality. In response, several mini-projects helped in the reforestation and safeguarding the natural resources of the Nilwala watershed with the active collaboration of the Forest Department.

An important component of integrated participatory planning is monitoring and evaluation. The SCOR Project developed a Management Information System (MIS) and monitoring and evaluation activities through a participatory procedure involving user groups, government and other project participants. It consisted of a review of progress with feedback to ensure that project inputs, work schedules, targeted outputs and other related actions were proceeding according to plan.

5. Conclusions from the Southern Provincial Workshop

16DAI, 1995, Mid-Term Evaluation, p. 31.

The Southern Provincial Workshop on Integrated Land and Water Resource Management was held in March 1998, to explore ways continue SCOR's approach after the project ended. The Workshop was attended by senior staff of Southern Provincial Council, district officials of Irrigation, Agriculture, Forestry, Lands, the Tea Small Holders Development Authority, the Divisional Secretaries of Galle and Matara Districts, and IIMI staff. The conclusions of the workshop demonstrate commitment to the approach which SCOR sought to foster during the project (see Figure 2). A follow up meeting in late September 1998 led to further commitments and identification of a source for possible funding of follow-on efforts.

- o Preparation of policy framework for the province with due consideration for the experience gained through implementing SCOR project in Upper Nilwala watershed.
 - o Not only projects, but also programs implemented in the province should be integrated to achieve the objective of the integrated land and water use plan of the province. Make all concerned parties (stakeholders) aware of the necessity of integrating projects, programs, and activities of all agencies in the province.
 - o Identification of watersheds and sub-watersheds for future planning and preparation of integrated plans based on the need of each watershed.
 - o The proposed establishment of a culture for sustainable resource use should include the following elements:
 - Participatory mapping
 - Mini-projects
 - Watershed based planning and implementation procedures
 - Participatory planning and implementation procedures
 - Awareness creation on sustainable practices
 - Policy frameworks supporting sustainable resource use
 - Demonstration of sustainable practices
 - Introduction of organic farming practices
 - o Development of the established resource user organizations as resource management organizations.
 - o Provision of resources available with SCOR to local and provincial level organizations to continue the activities being implemented by SCOR at present.
 - o As the Southern Province Development Authority (SPDA) is a development agency of the province, key agencies like the Provincial Planning Secretariat, the Land Commissioner's Office together with the Development Secretariat will be coordinated through this Authority.
 - o Provision of necessary technical assistance by IIMI at least for another two years to continue the implementation of SCOR-initiated activities. Participants expect IIMI to function as a shadow organization during this period.
10. Obtaining a research report on the successful and unsuccessful interventions implemented in the project by SCOR in order to base future planning and implementation of activities on SCOR experience.

Figure 2: Conclusions of the Southern Provincial Secretariat's Meeting

Conclusions

- o The activities undertaken by the Sub Watershed Resource Management Teams and Watershed Resource Management Teams such as mapping, surveys, compiling data base and preparation of action plans contributed to the development of the subwatershed, and was a learning experience.

- o The GIS of the watershed and sub watershed was done by the Sub Watershed Resource Management Teams with technical support from the Project Office. Mapping did not , appear to have been developed as a tool for direct use by resource users, as recommended by the MTE.

- o SCOR contributed significantly to more integrated, more participatory, and more efficient (and synergetic) planning among line agencies. Such planning has contributed to more effective delivery of the services and support traditionally provided through line agencies. Because farmer involvement in planning is limited, however, planning innovations have not significantly improved the content or quality of these services (see also Chapter VI, below). The level of commitment to integrated planning in Nilwala watershed will most likely lead to its continued and wider use, and improvement, as an effective tool for improving resource management.

D. Action Research for Insight and Practice

1. Overview

Conduct of action research was a major activity area of SCOR. A number of research titles have been identified for perusal during the project period. The broad objectives of the SCOR research programmes was to:

- o Understand watershed characteristics, establishment of watershed database and monitoring systems;
- o Conduct participatory benchmark surveys to identify possible areas of interventions;
- o Conduct diagnostic analysis to prioritise key constraints and choice of interventions;
- o Conduct special research studies to generate knowledge and evaluate impact.

The following table summarises the research issue of planned research, the coverage in terms of objectives listed above, whether research out put is available, and the relevance of the research for current issues observed during the evaluation. The report on SCOR Achievement in Phase I and Work Plan for Phase II (1996) and 2nd Quarterly Progress Report of 1998 are used as the reference material.

Table 5 Analysis of Research Conducted for SCOR

Research Issue	Number of articles	Number of Articles Prepared on the Issue		Output is included in the on-going planning process	Relevance of the Issue for current research needs as evaluated by the team
		HWS	NWS		
Water use efficiency & water management	2	12		No indication	Over emphasised as a topic & repetitive
Land tenure	1	3		Yes	Necessary, but insufficient research
Economic efficiency	1		2	No	Necessary, but insufficient research
Women's role	1				Necessary
Labour market	1				Necessary
Ground water management	3	2		No	Necessary, but insufficient research
Water deficit & farming system	1	2		No	Marginally important
PRA and GIS for planning	1	7		Yes	Necessary
Evaluation of conservation & Biodiversity	1	5		No	Too early
Evaluation of PRA methods	1	2		No	Too early
Development Policy	2	1		No	Marginally important
Market analysis	1	1		No	Necessary, but insufficient research
User Organization		2	1	No	Necessary, but insufficient research
Technology evaluation		1	2	Yes	Necessary, but insufficient research
Energy and Environment			2	Yes	Marginally important

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Table 5 indicates that the effort on research was not balanced and many important issues were not dealt with. The research output was heavily concentrated in HWS, where 18 out of 23 completed research work was in HWS. It is surprising to notice the lack of research emphasis on economic considerations of several productivity improvement programmes, conservation programmes and tea development programme.

Although the strategy of the project is highly participatory in nature involving socio-cultural elements to a greater extent, a notable emphasis should have been taken to research on socio-cultural aspects of the project. The mid-term evaluation commented that most research projects are still too incomplete to be influencing the project implementation. However, the evaluation team found no evidence that research findings are judiciously used even now at the closing end of SCOR. The MTE suggested that research attention should be given to impacts of and tenure arrangements on productivity and adoption of conservation intervention and impacts of SCOR intervention on farm incomes and generation of alternative uses for family labour. Adequate attention by research on these issues was not observed.

2. Technological focus

SCOR tried to promote a considerable range of technologies (i.e., conservation and production practices). Many of these were off-the-shelf technologies, based on prior work by other agencies. For example, many of the interventions selected for promotion in Huruluwewa (e.g., contour bunds, changes in cropping pattern, etc.) came from the government's research farm at Mahaillupallama, where one of the Huruluwewa team members had worked previously.

SCOR applied appropriate generic criteria in its selection of technologies. For example staff recognized three kinds of technologies with respect to benefits--those that yield direct benefit in the short term, those that yield direct benefit only in the mid- to long term, and those that yield only indirect benefit, e.g., to downstream resource users. At the level of specific farmers in specific sub-watersheds, more specific criteria were developed.

SCOR's objective with respect to technologies was widespread adoption. The team found three factors at play which affected SCOR's success in identifying technologies which were actively and eagerly embraced by farmers--an important requisite for widespread adoption.

First, SCOR carried out participatory diagnosis and planning in the sub-watersheds it had selected for intervention. This appears to have been carried out in consultation with villagers, but did not result in their active appropriation of a process to examine the changing context of their livelihood systems and the resources upon which they depend. Among the products of these diagnostic and planning exercises were maps and transects, which were used to depict both existing management and future visions for management. These were apparently useful for the catalysts and other project team members, some line agency officers, but did not appear to be used by farmers themselves in describing or analyzing their situations and options for the future.

Second, although some degree of consultation surely took place, the team found little evidence of active involvement of the farmers in the selection and adaptation of these technologies. For example, no methodology appears to have been applied to elicit farmer's own criteria with respect to the choice of particular technologies. Although ex-post review by researchers examined farmer experience in applying specific technologies, the flow of this information into the team's decision-making was hindered by poor teamwork, as discussed below. Thus, the fit of the technology was not well addressed in most cases.

Finally, SCOR provided various kinds of support that affected levels of adoption. With respect to specific practices, support provided included technical advice, training, and subsidized inputs. With respect to soft technologies (forms of organization, tenure interventions, etc.) support also included cash subsidies, brokering with high-level officials, and policy-level change. The North Central Provincial Agriculture Secretary noted that such support tended to reinforce a dependency habit. He also observed that more often than not, a supported village would adopt but the neighboring village would not: We always have demonstrations ... but they don't adopt. However, he added, some innovations were adopted, e.g., the introduction of a less water approach, substituting maize for paddy, was adopted and by small holders as well.

The team was told that during a significant span of the project, teamwork within the SCOR team at each of the two target watersheds did not function well. There was a particularly acute rift between the researchers and the catalysts. Unfortunately, these were precisely the groups who had the most to contribute to each others understanding and to the team's effectiveness in helping resource users test, adapt, and if appropriate, adopt new conservation and productivity technologies. In the final year of the project, good progress was made in bringing these groups together. In both watersheds monthly meetings were held where process documenters, who were the field staff of the research sub-team, and catalysts met together to discuss findings and progress at the field level.

Conclusions

- o With few exceptions, the immediate results of SCOR's mix of analysis and support was:
 - Limited adoption of technologies outside of the areas of direct intervention, and
 - Neither (a) clearly documented analysis nor (b) commonly shared understanding of why adoption had or had not occurred.

The end result was a project which languished with respect to changes in land management practice. At no point did the project identify key leverage or entry points of specific practice which, in and of themselves, were so attractive to farmers that they were eagerly and enthusiastically taken up and spread.

- o Research studies did not contribute significantly to deeper nor to more widespread understanding of a number of key factors and relationships affecting watershed management. For example, research did not contribute significantly to a deeper understanding of the relationship among resources, institutions, incentives, and technologies which affect the behavior (management practices) of an individual resource users. On the one hand, the effectiveness of particular methodologies in helping diffuse technologies was not examined. At the other end of the scale, relationships between upstream and downstream costs and benefits on a watershed basis were not addressed. The results of the studies which were carried out have not been widely shared.

- o SCOR did not respond effectively to opportunities to address systematically the complexity of factors affecting farmer resource use decisions. With respect to the great variability of water resource availability in time and space, for example, the project did not respond to the stress incident of drought in Huruluwewa as a learning opportunity, but rather as an impediment to project success. It did not make use of such opportunities to engage in the participatory problem-solving (i.e., true action research), with farmers or with other actors, that such conditions offer.

- o Among other issues for research which the evaluation team felt also merited attention were the following:

- Financial and economic viability of all production oriented components.
- Alternative conservation practices and relative impacts on production and protection.
- A detailed farming system analysis with a view to identifying appropriate crops, cropping systems, conservation systems and type of incentives required.
- Cropping systems with both short term and long term financial benefits.
- Trade off between commercialisation versus conservation in agriculture.
- Impact and support of community-based organisations and farmer companies in developing entrepreneurship in agriculture.
- Role of farmer companies in conservation: Policy orientation.
- Alternative institutional arrangement for production and protection improvements.¹⁷

E. SCOR's Catalytic Role

SCOR played a number of important catalytic roles over the course of the project:

- o First, SCOR played a pioneering role. Few other projects in Sri Lanka had attempted to address land and water resource management issues at the watershed level. Only a few projects in Sri Lanka had attempted to base project efforts at such a scale on a participatory approach. Finally, few other projects had attempted to apply action research to such a complex set of inter-related factors as are present in watershed management.
- o Second, SCOR played a role as a facilitator of innovation. Through SCOR, numerous innovations in policy and organizational approach, and dozens of innovations in resource management practices were tried. It carried out this role in two very distinct field contexts--Huruluwewa and Nilwala watersheds--and at multiple institutional levels.
- o Finally, SCOR attempted to play a role that was catalytic in the classic sense--enhancing the change process but neither needed nor involved in sustaining the resulting changes.

SCOR was effective in the first two of these roles, but not very effective in the last. The inherent weakness in SCOR's approach with respect to the last role were clearly identified in the MTE in 1995 regarding a much needed reexamination of IIMI's role as the **implementor** [original emphasis] of SCOR. (p. 30). The MTE went on to recommend that

SCOR must focus on identifying institutions and mechanisms to continue SCOR interventions in its absence...SCOR should assist local government agencies and service organizations to experiment with simplified, low-cost systems for accomplishing group formation, land use planning, conservation, production, and land tenure objectives. In assisting others to implement these models, probably in the last two years of the project, SCOR should act principally as advisors, gradually phasing out its project field staff, while concentrating on training other agencies to take over SCOR management innovations. (p. 57).

Although the need to hand over key functions was clear, to whom which functions would be handed over had not been identified clearly in the original plan. During the last two years of the project, NSC members failed to reach agreement on this critical point. Their discussions as recorded in various meetings of the NSC note the importance they gave financial resources for these tasks.

¹⁷A soon-to-be published paper (IIMI, 1998, Institutions for Shared Management of Land and Water on Watersheds: A Case Study from Sri Lanka) does look at this issue.

Conclusion

o SCOR's effectiveness as a catalyst which created sustainable changes was affected by a key design decisions--the decision not to identify a formal field and national-level counterpart for SCOR, who could gradually assume implementation responsibility for key functions. It's ability to work as a catalyst was also affected by the relatively short time frame for the project, given the complexity of the effort and the relative novelty of the approaches proposed. This was exacerbated by the decision to end the project just at the time when it had begun to resolve the issues of complexity and focus which had been affecting it so adversely.

o SCOR's effectiveness as a catalyst was also limited by the failure to come to agreement on an institutional arrangement to continue those key functions carried out by SCOR which merited continued investment. Insufficient clarity concerning key elements of the approach and how they should be consolidated in a replicable model may have contributed to this lack of agreement.

V. EFFECTIVENESS AND RESULTS OF SPECIFIC APPROACHES

A. Overview

The present chapter assesses the effectiveness of specific approaches or methods which SCOR used, under the overall approaches discussed in the previous chapter. The most important of these specific approaches were:

- o A user group approach, working with and through a variety of primary and secondary-level farmer and resource user groups;
- o Mini-projects, through which grants and technical assistance were provided to initiate and/or support a variety of groups and enterprises;
- o A variety of mechanisms to develop both formal agreements and informal relationships between resource users and the state;
- o Innovations in land and tree tenure; and
- o Farmer companies.

Each of the above approaches, which could be described as involving process innovations, was generally accompanied with a range of specific resource management and production innovations. SCOR worked with a great number of the latter, more specific, generally technical interventions over the course of the project. A partial list of these resource management innovations and the process innovations through which they were introduced is provided in Table 6. The evaluation team understands that a considerable volume of data was collected to monitor adoption of many of the specific resource management innovations. However, this data was not yet available in a form useful for drawing conclusions regarding the relative success of the various innovations tried. Additional detail on specific resource management innovations is provided in Annex 7: Increased Farm Productivity and Conservation. The present chapter focuses on SCOR's organizational or process innovations.

B. Resource User Orientation: Strengthening User Groups

1. How the concept evolved

The concept of the resource group was that individuals in the rural community who were interested in a particular hobby or vocation related to SCOR's basic theme were brought together by the catalyst to further undertake and promote the activity. During the course of the project, SCOR found that once the activities were completed, the resource groups disintegrated.

Table 6 : Selected Process and Resource Management Innovations under SCOR

Process Innovation	Resource Management Innovations (partial list)	Sub-watersheds
Granting of land use rights on chena and encroached lands	Agroforestry (long-cycle timber crop interplanted with annual crops for first 4 years); contour bunds	Huruluwewa: 28 sub-watersheds; 6 focal areas subwatersheds Nilwala: 8 sub-watersheds; 4 focal areas
Granting of tree tenure rights: (streamside and roadside reservations)	Fruit tree planting (mango, banana, citrus, coconut, etc.)	Nilwala: All 4 focal sub-watersheds Huruluwewa: all 6 focal sub-watersheds
Integrated planning with line agencies and resource user groups	Home gardens: fruit tree planting; compost and organic matter recycling; contour bunds and ditches; mulching Livestock: breed improvement and animal distribution Beekeeping	Nilwala: All 4 focal sub-watersheds Huruluwewa: all 6 focal sub-watersheds
Resource user groups	Same as above, and also Mushroom cultivation (training) Medicinal plants Mini-hydro Jak/breadfruit processing (drying)	
Farmer companies	Maize and soya production Milk processing and marketing Treacle processing and marketing Anthurium production and marketing Chili; onions production and marketing Fertilizer, seed, and other inputs Business management skills	Huruluwewa: Kalundewa Nilwala: Diyadawa Thenipita, Nilwala: Horagala Nilwala: Kiriwandola Huruluwewa: Kalundewa Huruluwewa and Nilwala Huruluwewa and Nilwala
Tea societies and Resource user groups, in collaboration with tea plantations	Tea land productivity: infilling, fertilizer application, pruning, shade management, soil and moisture conservation	Nilwala: Anninkanda, Diyadawa Thenipita, Horagala, Milla Ela sub-watersheds
Service farmer organizations for input supply and technical advice	Weed and pest control, fertilizer application	Nilwala
Farmer organizations	Integrated water management: feeder canal, tank and wier system management, ground water use	Huruluwewa
Land consolidation through farmer organizations	Paddy management Tank system management	Nilwala Huruluwewa

The original concept for the role of the catalyst in the SCOR project was based on prior experience in Sri Lanka, as noted in Chapter IV, Section A. The catalyst was to be a motivator and a

facilitator, helping to build capacity and self-reliance. Although most of the catalysts had prior experience, during SCOR's implementation they began to assume the role of implementor rather than motivator and facilitator, creating dependency in the process.

The main activity with which SCOR approached these groups were conservation and agricultural production. Attempts were made to introduce some production activities like planting coconut seedlings or banana, cultivation of seasonal crops, permanent crops or animal husbandry. Other popular activities were *kithul* treacle, vinegar production, plant nurseries, milk production, leaf sack production, beekeeping, mini-hydropower and stream reservation conservation. Some women groups who were interested in making curd or rice processing were formed into groups. Almost all the groups were single purpose groups, although members holding membership in one group sometimes held membership in several other groups to acquire more benefits from these groups. Members of the groups planted various tree crops provided by SCOR catalysts.

It is interesting to note that although the operation and maintenance of field canals and utilization of irrigation water is an important activity, particularly in the Huruluwewa scheme, the team came across no indications that groups existed at the field canal level. The resource user groups had no organizational structure. There were informal gatherings of the group and no records were maintained.

It is reported that the activities of the groups were interrupted due to the formation of higher-level organizations. For example four active groups in Padikaramaduwa were reduced after the formation of the Mahasengama Farmer Organization in the same area. It was also observed that the interaction between members of an organization was much weaker than that in the groups.¹⁸

2. Inputs and activities

Almost all the groups received small grants ranging from Rs.1,000 to 10,000, from SCOR for the purchase of agricultural inputs such as seed, plants, fertilizer and agro chemicals depending on the crop cultivated. Some members of Groups had the practice of building up of a Group Fund for them to take loans when required. The SCOR Project usually granted small grants and credit facilities to Resource Groups. For example the Soya Group in Garandiyaulpotha in Huruluwewa watershed was given credit facilities for Soya cultivation in 1994/95 *maha* through the Nikawewa Farmer Organization which in turn received a grant from SCOR to purchase soya. It is reported that the soya group made a profit of Rs.25,000, which was distributed among the members to settle the loan taken from Nikawewa Farmer Organization.

The SCOR project also promoted women's groups in all aspects of watershed management. It is reported that homestead development was a major activity for women¹⁹. In many instances members of the group were specially trained by SCOR to enable them undertake the production or the processing of the specific crop.

3. Impact of the resource user groups.

A major impact of the resource groups was the ability of SCOR to initiate as many people as possible to take up soil conservation and environmentally friendly production practices. However, the life span of groups was short. It is reported that in Huruluwewa watershed almost all the resource user groups had ceased to function even prior to end of 1997 (Somaratne, 1998). The few

¹⁸Somaratne, 1997.

¹⁹ Ibid.

groups still surviving are the thrift and credit Groups formed by the IRDP and Janasaviya. Figure 3 shows the rapid decline in groups.

In the Nilwala watershed there are 12 resource user groups engaged in floriculture, plant nurseries, home gardening and stream reservation development.²⁰

The drought conditions that prevailed in the Huruluwewa watershed also seriously affected Groups involved in agricultural, production and protection activities could not provide benefits to their members.

²⁰IIMI, 1998, SCOR Progress Report, 2nd Quarter 1998.

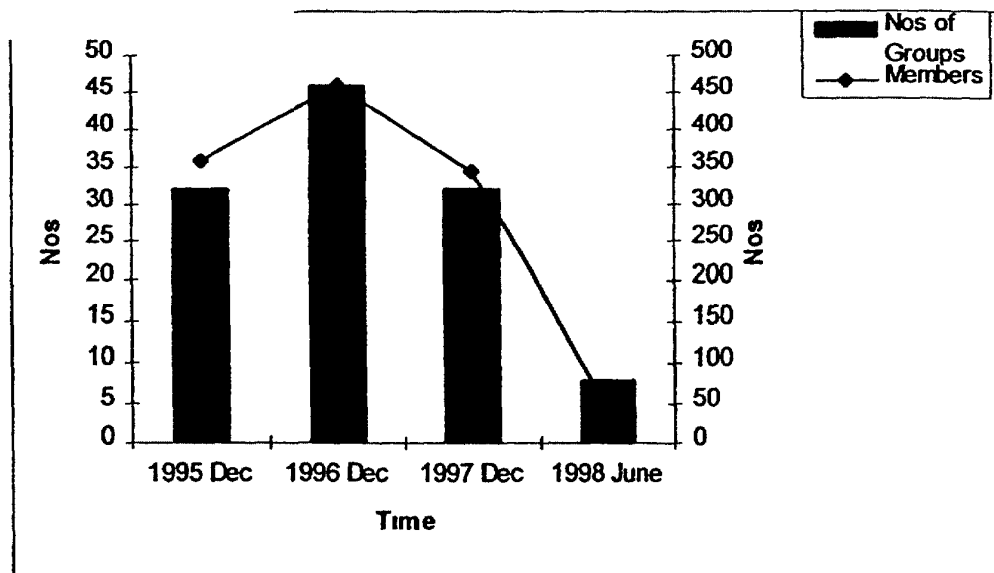


Figure 3 Rapid Decline of Groups

V-4a

Conclusions

o SCOR's objective was to encourage as many people as possible to take up soil and water conservation and environmentally friendly production practices within a short period to achieve project targets. Following initial experience, SCOR abandoned attempts to develop sustainable grassroots groups or to bring about institutional development at the grassroots level, e.g., promoting organizations at the Grama Niladhari or the Divisional Secretary level. A valuable opportunity was lost. This may have been due in large part to the excessively high targets for promoting early and massive adoption of soil and water conservation and environmentally friendly production practices. The increased targets distracted the SCOR team from what the MTE recommended: a greater focus on developing a model suitable for use by other organizations (e.g., line agencies or NGOs), rather than its own direct implementation. Another result of a narrow target orientation was the neglect, at field level, of further group strengthening once the nominal target of group formation was achieved.

o The emphasis given to higher-level resource user or farmer organizations disrupted the strengthening of base-level groups, thus weakening the very constituency of the higher-level organization. An alternative would have been to build on the base-level groups to form kindred groups, based on the common (generally commodity-focused) interest which farmers had. This could also have solved the problem of obtaining legal or institutional recognition for small groups.

o SCOR's approach to user groups was only partially effective in involving local farmers and villagers in the project's activities. International and Sri Lankan experience has clearly demonstrated that effective participation of local farmers and villagers in the design and implementation of project activities contributes to their effective impact in the immediate area, and to the potential for replication and sustainability. Three key elements of participation that could have been strengthened in SCOR include:

-- Improved collaboration with local people in the action research and field-level learning opportunities of the project, e.g., involving farmers more effectively in the setting of objectives for, design, and implementation of each field innovation; and

-- More effective training and practice, focused on and reinforcing the specific objectives of each activity;

-- Use of farmer-to-farmer extension of innovations, backed up with the above-noted training and practice.

Greater involvement in hands-on experimentation (supported by good science and effective training) could have helped develop, for example, greater skill, confidence, ownership, and responsibility in trying out conservation and productivity-enhancing technologies among farmer groups.

C. Mini-Projects and Sub-Grants as Tools for User-Level Institution-Building

1. Evolution of the approach

The mini-projects were designed in a participatory manner with the community (mainly farmer organization leaders) and the catalysts of the SCOR to achieve an increase in the production while conserving the natural resources. The main activities included in mini-projects in both NWS and HWS include:

o Strengthening of the farmer organization;

- o Planning and implementation of productivity improvement oriented and conservation oriented crop planting programmes;
- o Implementation of soil and moisture conservation activities in selected sub-watershed areas
- o Implementation of livestock development programmes
- o Monitoring of the mini-project activities
- 2. Application of the planning approach

A considerable amount of activities of mini-projects in both HWS and NWS have not been implemented due to the following limitations observed during the field discussions.

- o There were considerable differences between the activities planned in mini-projects and activities implemented. Less participation of beneficiaries than expected, allocation of funds in activities which have not been envisaged in the mini-projects, and lack of broad awareness of certain activities (e.g., mushroom cultivation, beekeeping, in NWS, and artificial insemination of dairy, beekeeping in HWS).
- o Lack of active participation of technical officers from line agencies was a limitation to implement number of activities in HWS. Examples are dairy component, horticulture component, bee keeping activities in HWS. The observation in NWS is very much different where there was an active participation of the line agency officials in implementing activities.
- o There was no proper strategy and regular action in both NWS and HWS to recover loans given to the farmers for various activities under mini-projects. A legal process involving loan recovery is virtually absent. The loan recovery rate of some activities (e.g. Micro-hydro component in NWS) was almost 90 percent, but certain activities such as dairy, goat, and soybean cultivation in HWS have less than 20 percent loan recovery
- o There is no clearly spelt out arrangement to implement the revolving fund generated with the funds provided for mini-projects.
- o SCOR did not set up monitoring of some form of control corresponding to the components of the mini-projects so that a comparative insight of the mini-project intervention could be gained.
- o On-going analyses on expenditure and incremental benefits of mini-project would have been useful to understand the cost effectiveness of mini-projects in gaining production and protection advantages under SCOR intervention. This has not happened in either pilot watershed.
- o A process of learning on-going lessons based on mini-project experience and feeding back the experience to develop the intervention methodology and strategies of SCOR was weak in both watersheds.

The mini projects and corresponding sub-grants were expected to be the basic tools adopted in the SCOR intervention process and in mobilisation of the community in HWS and NWS. A part of the funds provided for the mini-project has been used for institutional building in community-based organisations (CBO). These organisations were active to implement the mini-projects. Thus the mini-projects assisted to initiate CBOs and obtain broad base community participation for CBOs.

A considerable portion of the funds received under mini-projects was channeled as the initial capital to form Farmers Companies in both NWS and HWS. The proportion of the share capital contributed from farmer organisations (FOs) is more than 50 percent of the total shares of all the companies in NWS and HWS. The FOs received their funds as grants from SCOR for the implementation of mini-project and transferred to farmer companies as a loan. This fund transfer was not envisaged in the planning process of mini-projects. Thus the mini-projects have not progressed as planned. However, there was a positive impact of mini-project funds on the formation of the farmer companies.

As catalysts and the leadership of the community organisations took the lead role in formulating the mini-projects, the participation of a broad spectrum of the community was found absent. In the implementation too, many components of mini-projects were individual farmer oriented rather than group oriented. Thus there was no evidence to conclude that mini-project formulation or implementation had an impact on the community mobilisation aspect of the institutional building.

However, in order to implement some of the components of mini-projects, community leadership was focused and closely involved. Linkages were initiated both vertically and horizontally with other community-based organisations, service organisation at the apex level and various line agencies. These linkages were very clearly instituted in NWS and less clear in HWS.

This process was used as a tool for institutional building and community mobilisation. Sustainability of mobilisation and institutional building will be based on a number of factors or principles, inter-alia:

- o The degree to which the community at a wider level (not limiting only to organisational leadership) is empowered to formulate or initiate the formulation process of mini-projects,
- o Collective identification of opportunities and utilisation of the revolving funds provided for organisations in such opportunities, and
- o Broad based participatory monitoring of the funds where the majority of the community is involved.

The team found no evidence in either HWS or NWS to support the view that the mini-projects were based on these kinds of principles.

Continuation of the structure, conduct and performance of CBOs with broad-based community participation will depend on search of new opportunities and formulation of new mini-projects. There were some attempts of this nature at the Farmer Company level in NWS. However, the team could not observe these activities in both NWS and HWS as a general thrust of the CBO or Service Farmer Organisation at the apex level.

The process of granting funds for mini-projects and the process allocating funds in various activities have been different from the general financial regulations and procedures of a government

institution. The leaders and managers of the CBOs may not be able to apply the training and the experience of financial management gained through this process if such mini-projects were operated by any government institutions.

Conclusions on impact

o The mini-projects assisted in the initiation of community-based organisations (CBOs) and, particularly, in ensuring broadly based community participation in CBOs. The investment of a considerable portion of the funds received under mini-projects as start-up capital to form farmer companies in both watersheds had a positive impact on the formation of the farmer companies. It also created a close link between the farmer companies and the farmer organizations, which was necessary for farmers to initiate and sustain commercial links with the company.

o The above-noted transfer of funds, however, diverted resources from the program's original objectives, which led to minimal impact in community mobilization as an aspect of institutional building. Nonetheless, in some of the mini-projects, community leadership was well focused and closely involved, developing linkages both vertically and horizontally with other community-based organisations, service organisation at the apex level and various line agencies. These linkages were most effective in NWS and less clear in HWS.

o The project's approach to the participation of farmers and other villagers tended towards consultation rather than facilitation. Farmers were viewed at least implicitly, and usually explicitly, as a public whose awareness needed to be raised, who needed to be introduced to improved methods, and who must be given certain inputs and services to support their use of these methods. The organization of farmers into groups was carried out primarily as a means of achieving objectives defined by the project, and not as a means of helping farmers clarify, prioritize and work towards their own priorities with respect to their land and water management systems. They were not viewed as equal partners in creating a common understanding and vision, nor as equal partners in the management of resources based on such an understanding.

Conclusions on Sustainability

o The sustainability of the institutional processes and community mobilization stimulated by the mini-project program cannot be expected, except in some cases of farmer companies (see below). The team found no evidence that the process had incorporated any of a number of key principles, noted above, which would help ensure sustainability. With a few exceptions (including some farmer companies) continuation of the structure, conduct and performance of CBOs with broadly based community participation is unlikely, given the limited pursuit of new opportunities and formulation of new mini-projects.

o The process used for granting funds for mini-projects and for allocating funds in various activities makes prospects for continued growth of the program through government institutions unlikely, given their general financial regulations and procedures.

o Mini-projects could and did contribute to local institution building. However, a number of aspects of the programme affected the conduct and performance of the institutional building process:

-- Although the concepts and basic strategies of the mini-project programme remained unchanged during the course of its implementation, there were considerable changes made to activities, targets and even the scope of the projects. These kinds of mid-course changes were especially pronounced in HWS. The team learned that the changes were not made through a consultative process

among the catalysts, leaders of farmer organizations, and the community. The community and, in certain cases, even the leaders of farmer organizations were not aware of the initial activities or changes made to the mini-projects.

-- Changes in leadership of many farmer organisations in both NWS and HWS have taken place during the project period. Except in very few cases in NWS, the new leadership was not aware of the details of the mini-projects.

-- Although mini-projects included productivity and conservation components, a major share of funds have been allocated in promoting commercial activities to strengthen the farmer companies in both HWS and NWS.

Recommendations

- o Mid-course changes made to activities, targets and scope of projects, although often essential, should be made through a consultative process among the catalysts, leaders of FOs, and the community. A regular, participatory consultative process allowing mid-course changes to take place, and creating community awareness of such changes, should be included as a fundamental aspect of any mini-project program.
- o A rolling plan process, rather than a plan for the full implementation period, should be used. This will allow new leadership to become fully aware of the planning process and related institutional building processes.
- o Fund allocation among productivity, conservation, and commercial activities under a small grants program should be balanced and should not compromise investments in productivity and protection objectives which yield appropriate benefits in the long term or for downstream actors.
- o Farmer companies should avoid commercial activities on a production base, which is too narrow in terms of number of products.
- o Product diversification, even based on a single crop with different end products, should be encouraged.
- o Financial and other assistance provided for farmers companies should be phased out gradually and before completing the project period, the company should be allowed to run with absolutely no assistance.
- o The involvement of various other projects and programmes with user groups for developing commercial agriculture should be improved.

D. State-User Partnerships as Mechanisms for Shared Control

1. Overview

SCOR's innovative approach of shared control of resources within watersheds was focused on developing effective relationships between state agencies and user groups. These relationships were developed primarily at the subwatershed level. Both formal and informal linkages were developed with a host of government agencies, including the Forest, Agrarian Services, and Agriculture Departments in both Huruluwewa (HWS) and Nilwala (NWS) watersheds, and with the Tea Small Holding Development Authority (TSHDA) in Nilwala watershed. Also in Nilwala watershed, effective informal linkages were developed between tea estates and neighboring villages.

These linkages enhanced SCOR interventions with resource users at the farm and village level and among resource management officials and institutions at the district, provincial and national levels.

2. Partnerships and roles

State-user partnerships were active at the subwatershed, village, and farm levels. The multiplicity of farmer organisations (in themselves the result of SCOR interventions) created interest and openings for state organisations to foster and maintain close links at the subwatershed level. The best example is that of the Forest Department's involvement in stream level afforestation. The department's programme of re-afforestation was adapted to coincide more effectively with farmer groups' need for land and conservation in both the HWS. and NWS.

Similar examples of linking government programs with resource user needs were apparent in the activities of the TSHDA, Agrarian Services, and Agriculture. In the NWS, the needs of tea small holders were met through such conservation technologies as the construction of contour drains and embankments and the provision of vetiver planting material. Another example of technology adoption through new partnerships was the informal link between tea estates, through both management and workers, and neighboring small holders, which diffused such conservation practices as mulching and bunding and passed along related production expertise.

In Huruluwewa, similar partnerships were evident in watersheds where the Minor Irrigation Schemes were located and user organisations were established under the aegis of the Agrarian Services Department. In these areas, positive examples were the implementation of a recommended agricultural calendar of cultivation, related to water management, and the maintenance of village irrigation structures. In the NWS, the Department carried out tenurial consolidation of paddy lands. The Agriculture Department advised on diversification of crops, disease control, and other field and plot-level interventions. This kind of outreach by state agencies, which hitherto had been advisory-oriented, resulted in partnerships with user organizations which were considerably more dynamic and result-oriented.

Conclusions

o SCOR helped establish specific mechanisms in response to, and also contributing to, openings in the institutional environment permitting new kinds of formal relationships between resource users and the state. The most important of these mechanisms were those carried out under the Forest Department's newly adopted policy of afforestation of watersheds under a conservation approach, responding to resource users' felt need for some degree of defined tenure rights. The new policy provides limited, but well-defined, usufruct tenure linked with meeting production needs in both watersheds through the following mechanisms which were approved by cabinet:

-- Limited usufruct rights during the establishment of forest plantations (e.g., teak) on state lands; and

-- Rights to fruit crops planted along streamsides.

o SCOR helped develop more effective service delivery by government agencies and others through increased and improved linkages with farmer organizations. A broad range of agencies was affected, most significant examples are:

-- The Tea Small Holding Development Authority assistance to small holders in the NWS for adoption of soil and land conservation practices,

-- The Agrarian Services Department linkage with farmers in NWS and HWS under a water management and cultivation strategy, with consolidation of tenurial rights, and

-- The transfer of technology to farmers from tea estates.

o SCOR-supported state-user partnerships were significant innovative concepts within the framework of institutional development. The organisations and institutions involved linked active presence at the farmer organization level with authority to reach up to policy makers. However, SCOR did not focus effectively on developing sustainable groups at the grass roots level below the level of farmer organisations. It neglected developing service agency partnerships reaching down to the *Grama Niladari* level. As noted earlier, follow-up action after group formation was not carried out.

o The Steering Committees effectively coordinated activity and directed institutions to implement policies through the respective organisations. The manner in which this occurred was entirely dependant on the scope of the specific activity to be implemented in the respective watershed. In this context, sustainability is only partially ensured. As SCOR's facilitating role will not be operative, only those mechanisms which have a clear legal base will be sustainable.

Recommendations

o Future programmes for implementation should use the kinds of linkages developed by SCOR as key aspect of a deliberate policy strategy for provision of services at the local level.

o The estate-village relationship should be expanded and fostered.

E. Securing Tenure for Shared Control

1. Approach

a. Ownership rights to land

a. Ownership rights to land

It has been recognised conceptually that security of tenure is essential for the users to adopt sustainable practices in utilising and managing natural resources. A substantial number of target population in both watersheds however, do not have secure tenurial rights mainly for land and other natural resources. SCOR took the initiative to arrange the institutional involvements in providing tenurial security for the lands, which have been occupied or cultivated by farmers in both watersheds. SCOR has taken the following specific steps in implementing this operation:

o Identify users of land which have no secure ownership rights. The main land use systems in this type of land are *chena* cultivation in HWS and tea cultivation in NWS.

o Make linkages with the line agencies, Divisional Secretariats and other administrative agents in the village to facilitate the process.

o Formulating user groups to develop the land which have been secured with ownership rights.

o Linking line agencies to supply inputs to develop such lands.

Although SCOR envisaged to undertake examination and evaluation of legal mechanisms concerning user rights to ascertain the adequacy of rights structure to encourage user rights recipients to initiate and maintain production and protection, the team found no evidence to support such activities being implemented. The provision of rights was implemented within the available legal and land alienation framework of the government.

There was evidence that the land blocks now with ownership rights, which were *chena* land prior to securing ownership, have some form of soil and moisture conservation structures. The quality and the extent of the structures, however, are notably lower than expected.

No studies were carried out to ascertain the optimum size of land (mainly highland) that a family should be provided with tenurial rights taking the livelihood of the second generation too. There was some concern among the beneficiaries in HWS that block of land given for them with ownership rights will not be sufficient to maintain the second generation. In most cases the land which has been encroached was given the ownership rights. The size of such land is based on the consumption needs of current family. Except in very special cases, encroachments are mainly used for subsistence purpose.

A total of 503 has. have been secured under formal agreements for farm families under SCOR21.

2. User Rights to Trees 2. User Rights to Trees

Providing people with user rights to a limited extent of trees planted in sub-watershed areas is another type of tenure rights arranged by SCOR. Selected highland areas, road reservations, tank reservation and stream reservation of both watersheds have been allocated for farmers to plant trees, mainly forest trees. Those who plant have been given user rights of plants and land area under plants for a period of four years. Many of such participants have cultivated such land with annual crops under forest trees.

ConclusionsConclusions

Impact on the Process of Securing Ownership

- o The process of providing land ownership, which has been a government programme in many parts of the country, has accelerated in the two watersheds owing to the active involvement of SCOR in the process.
- o Deserved beneficiaries have been identified to provide with tenurial rights.
- o SCOR coordinated participation of beneficiaries, community based organisations, and line agencies which increased the collective awareness of the rights being given. This will hamper further effort on encroachment, as there will be social pressure against the effort due to collective awareness.
- o SCOR's work with tenurial rights for both land and trees provides basic experience useful for future efforts in this area. Beneficiaries had a stronger sense of ownership and used land more appropriately where use rights had been secured and technical inputs were made available.

Impacts on Land Use

- o Increasing population pressure and the dearth of fertile land in both watersheds have compelled farmer to encroach a land, some of which are in sensitive watershed. Without a proper ownership farmers will have only a marginal interest to maintain the productivity of land. By securing the ownership, providing various agricultural inputs and know-how to develop the secured land, and

21Ibid.

making users conscious of the sustainability, SCOR could hamper the process of encroachment in sub-watersheds in both watersheds.

- o There was evidence to suggest that lands encroached and cultivated under *chena* have reduced. This is attributed to the fact that as farmers have a block of land with secured ownership, they cultivate that land. The resource at their disposal, particularly labour, is inadequate to indulge in *chena* cultivation.

- o The land which were under *chena* prior to securing ownership now have soil and moisture conservation structures established, thereby increasing the land extent under conservation practices.

- o There was an improvement in the entrepreneurship, in agriculture in both watersheds. This is partly due to the intervention of farmers companies. However, the secured ownership to the main production resource also facilitates the entrepreneurship.

- o The pressure on tank and stream reservation for cultivation has reduced, as many of the farmers cultivates such lands have been given ownership rights for lands elsewhere.

- o Usefulness of conservation of forestry and public awareness prohibits encroachments as useful if conservation of forestry is understood..

Impacts on Policy

- o As there was no related empirical studies or different strategies, the ownership securing policy of the government or the strategies adopted in implementing the procedure has not been affected or benefited by the tenurial arrangements organised under SCOR.

- o Although there were several suggestions made at the national steering committee to be considered to set out changes in existing land laws and regulations as mentioned in MTE report, no evidence was found that such changes have taken place in the policy. Thus SCOR failed to have an impact on the land policy changes.

Conclusion on Sustainability and Replicability

- o Transforming tenurial control of watershed reservations to individual farmers in sub-watersheds is a necessary but not sufficient condition for adoption of conservation practices.

- o Shared control has proven effective in encroached areas and could prove applicable throughout Sri Lanka. SCOR's experience indicates that effective shared control depends on:

- Land already under use by settlers;

- A program in place which provides access to conservation technologies by resource users in that area;

- Regulatory procedures applied correctly under existing government policy. This requires active government initiative by district level staff, and some form of public outreach or education regarding those procedures.

F. A Market-Oriented Approach: Commercialization through Farmer Companies

Marketing opportunities for the project beneficiaries have been organised through the farmer companies established in HWS and NWS. SCOR initiated two farmer companies in HW, the Huruluwewa Farmers Company and Dambulu Farmers Company, and three in NWS. A brief overview of one of the companies in NWS is given in Figure 4.

The **Nilwala People's Agro-Processing Company** was formed in **1995**, with 52 members each contributing 10 rupees. The following year, with SCOR financial support, the four sub-watershed based Service Farmer Organisations (SFOs) contributed share capital of Rs. 221,560. At present, there are **157** individual members plus the four SFOs, which represent about 5,000 members. Total share capital is **Rs. 229,080**, a little over US \$3,500.

The Company's major activity through last quarter was the collection, processing and marketing of treacle. Since February 1997, the total quantity purchased amounted to over 50 metric tons, with a value of **Rs 3,347,589**, about US \$50,000.

The Company employs a manager, a watchman, and eight labourers.

Since its founding, the Company had been involved in a variety of production and protection activities in collaboration with Service Farmer Organisations:

- o The Company helped establish papaw (papaya) nurseries to increase production. The company supplied seeds, polythene bags, and other materials sufficient for 5,000 plants.
- o The Company established marketing and other support services links with CPC Lanka, Ltd. to promote passion fruit cultivation. CPC Lanka, Ltd. has agreed to provide 9,000 plants, of which 1,500 plants have already been supplied and 6,000 more are ready for collection. This is sufficient to cover an area of approximately 10 hectares.
- o The Company has distributed 750 improved *kithul* plants to farmers. A nursery with a capacity of 500 additional plants was established in 1998.
- o The Service Farmer Organisations are now engaged in collection and marketing of a range of agricultural products, including pepper, cloves, areca nut, jak seeds, and papaw. The Company started purchasing these products from Service Farmer Organisations in April 1998.
- o The Company has established links with a leading agro-chemical supplier and arranged supplies to organisations with enhanced rebates.

Figure 4: The Nilwala People's Agro-Processing Company, Waralla

- o The farmers companies in HWS purchase maize, and soybean at a large scale and paddy, onion and other field crop products at a lower scale. The farmers companies in NWS purchase milk, treacle and spices at a large scale and other agricultural produce at small scale.
- o It was observed in HWS that there is a very marginal increase in the open market for maize and soybean (Rs 2.00 for maize and Rs 5.00 for soybean). The farmers and the

board of directors of the Huruluwewa Farm Company attribute this price increase to the involvement of the company in buying these products at a higher price.

- o The net profit of the Huruluwewa Farm Company for a period of one year (1997/98) was Rs 101,578 yielding a value of a share of Rs 6.78 according to the audit report of the company. The value of a share at the commencement of the company was two rupees. The evidence thus shows that the company is commercially viable according to its current status. However, discussions revealed that the companies, particularly Huruluwewa Farmer Company, receives various types of assistance such transport, technical advice, securing market linkages, etc. from SCOR.
- o The farmer organisations of both NWS and HWS are closely connected with the respective farmer companies through allocating FO s funds as shares in the company. For instance Huruluwewa Farmers Organisation has allocate Rs 524,888 as shares in the Huruluwewa Farmer Company.
- o Estimated quantities of *kithul* jaggery and treacle produced for market in the sub watershed NWS areas are 1000 kg and 3000 – 4000 bottles per month respectively. There was no attractive marketing system for treacle, except the traveling collectors in the village. As an alternative marketing channel, the Farmers Company established market linkages with outside wholesale markets to produce bottled treacle with value addition.
- o The involvement of both project staff such as catalyst and enterprise development specialists has been highly oriented towards commercial activities. The team observed that there is a compromise between the commercial activities and the production with protection activities, which is the major task of the project. This situation should have been avoided. The MTE, too, expressed this concern and suggested that various other external donor funded project should pay attention to enterprise development and commercial agriculture leaving SCOR to focus on natural resource management. However, evidence suggest that there is no change in emphasis.
- o Anthurium cultivators on NWS were linked to buyers of cut flowers both in Colombo and Provincial cities.

Conclusions on Impact

- o Farmers who cultivate vegetable, field crops such as maize, soybean, black and green gram, chillies onion etc. in HWS, and fruits, vegetable, cut flower and spices in NWS found marketing as a main problem for them to organise agriculture as a commercially viable venture. The milk and treacle produces of NWS also share the same problem. The main issue in marketing is the inadequate prices for their outputs and higher prices of their inputs arising from a wide marketing margin exist between the producers and the retail trader. The introduction of farmer companies trading both inputs and outputs has facilitated marketing.
- o The Huruluwewa Farmer Company offered an incremental price of Rs 8/kg of soybean and Rs 3/kg of maize for the farmers (net of transport cost). An average farmer producing 2,000 kg of maize during *maha* could secure an incremental income of Rs 6,000, which will add about Rs 500 to monthly income. For soybean, the average production of a farmer is in

the range of about 1000 kg during *yala* season which generate a incremental income of about Rs 8,000 giving about Rs 600 as monthly incremental income. This is a substantial income increase when compared to the poverty line of Rs 1500 per month.

- o Farmer companies have supplied farm inputs such as fertiliser, agro-chemicals, farm implements and planting material a price lower than open market prices. The fertiliser co-op and chemical companies provide these items at lower prices for farmer companies as a policy. A major part of this price advantage has been transferred to the farmers through the company.

Conclusions on sustainability

- o Sustainability of farmer companies, as business ventures will greatly depend on the financial viability of the companies. Company accounts suggest that Huruluwewa Farmer Company, Nilwala Agro-Product Farmer Company have financial stability to continue. The two farmer companies in NWS have broad base product range to diversify their business. For instance, two farmers companies in NWS deals with purchasing a variety of agricultural products, processing a variety of milk products, and selling fertiliser and agro-chemicals. This type of market portfolio will be adequate to sustain the business.

- o The Huruluwewa Farmer Company however has a narrow range of products. Maize and soybean transactions contribute nearly 85% to the company business. Nearly 50 percent of the income from selling maize (Rs 6.08 million out of Rs 12.7 million) has obtained from Thripasha Company on a government contract, which is said to be valid for next five years. This company has offered Rs 16 per kg of aflatoxin-free maize, which is Rs 6 higher than the other markets. In the case of soybean the total transaction was with the Health Ministry on a government contract. The sustainability of the company thus greatly depends on the continuity of these contracts.

VI. INSTITUTIONAL MECHANISMS FOR REPLICATION AND SUSTAINABILITY

The broad objective of SCOR was to improve natural resource management in the two watersheds (HWS & NWS) while improving productivity with due regard for the environment. An important focus was the traditional agricultural practice of chena (slash and burn) methods which were environmentally harmful. The main resource affecting productivity in HWS was the availability of the Mahaweli waters and the major water management complex in the Huruluwewa Tank. A feeder canal channeled Mahaweli water into this tank as well. Together with this were the village tanks, which were mostly rain-fed and fed by small rivulets. The resource management encompassed land use patterns of cultivation in paddy fields and the chena (slash and burn) methods.

The objective of SCOR with respect to institutional sustainability was, at one level, to improve and strengthen the capacity of the provincial and divisional level authorities of the Government of Sri Lanka (GSL) in integrated planning and resource use, transforming the activities initiated by SCOR from project to programme mode. At the local level, SCOR worked to create sustainable farmer organizations, linked in partnership with these government authorities. Only late in the project did SCOR begin to adopt an advisory role, as the MTE had recommended, with respect to the innovative models it had supported. Early adoption of such a role would have helped SCOR to address the resource implications of its models. As the Provincial Secretary in Anradhapura noted, the project experience was very good, but due to lack of funds, we could not extend it to other areas. The importance of involving the GSL, which, for example, still controls almost 90 percent of the Huruluwewa watershed, was stressed by many persons the team met. SCOR did examine a range of government institutions which might be able to take over certain models.²² However, with some exceptions, SCOR had not involved these institutions either early enough or significantly enough for their officers to feel the models fit the resources available to them.

The institutional mechanisms which were available were, at the District level, the Steering Committee; Farmer organisations at grass roots level--both those legally constituted and those concerned with the social needs of farmers, a multiplicity of such institutions from death donation (funeral) societies to home gardening and women's societies. In the NWS, institutional mechanisms also included societies linked to Tea Estates which gave farmers technical know-how and provided them with an institution which gave them employment and provided them with water resources (streams) which were needed for their cultivation practices. By the end of the project, an inter-related set of institutions was functioning in the NWS (see Figure 5).

A new dimension was added to this host of institutions through the commercialisation of agriculture. In the HWS, the lack of water had led farmers to diversify into cultivation of soya (soybean) and maize, which responded to a highly remunerative market. In the NWS, the high price of tea encourage farmers to encroach on forest to cultivate that highly remunerative crop. In the context of commercially based agriculture, the development of farmer-based companies introduced changes into the long established system of fairs and middlemen traders and replaced cooperatives to some extent.

[fig. 6]

²²Wijayaratne, 1997.

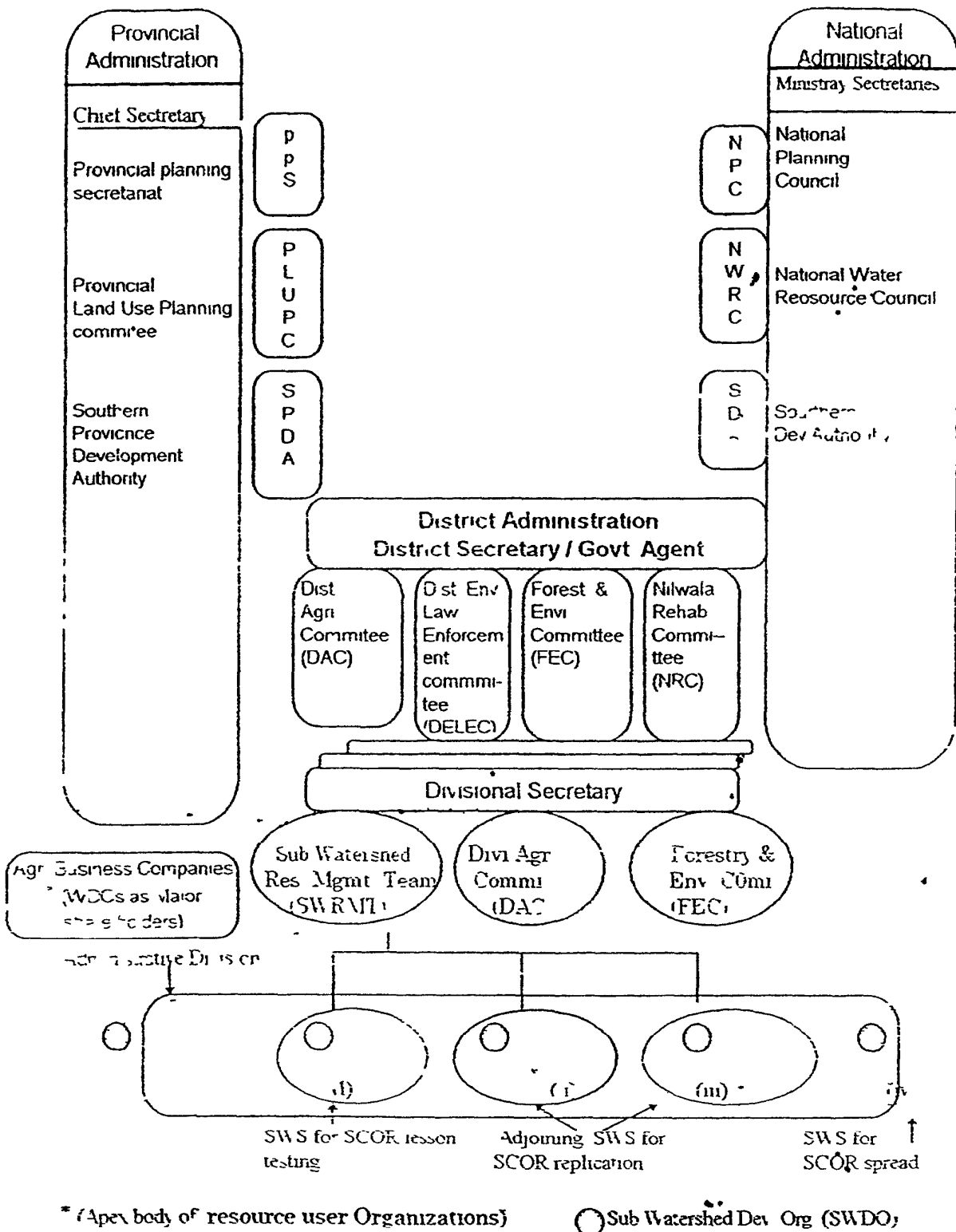


Figure 6 Institutional Infrastructure available for SCOR Institutionalisation and Replication

Conclusions

o SCOR had the following impacts:

-- Integration of resource management at the sub-watershed level in the context of the existing major and minor irrigation schemes in HWS, including new water supplies from the Mahaweli system, from the canal which was finished shortly after SCOR began. Farmers were able to diversify their cropping strategies. In this process, institutions which were partly functioning were regenerated, e.g., farmer organisations dealing with water releases and cultivation practices.

-- Similar integration with respect to forestry programs under a two-way approach of agro-forestry practices linked with tenure security.

-- Diffusion of conservation practices by building on tea estate technical know-how in NWS.

-- Gradual abandoning of slash and burn methods of cultivation in selected areas in favour of conservation and diversified agricultural practices.

o Farmers have gained increased experience with commercialisation, through their investments in farmer-owned companies by purchasing shares.

o The withdrawal of SCOR may be too early to permit the new institutional structures to thrive.

o Replication of significant elements of SCOR's approach is within the capacity of provincial programme in both wet zone and dry zone watersheds. Particular attention must be given to enlisting the support of stakeholders at all levels and maintaining and/or developing further the linkages established during SCOR's implementation. The dynamic role of the catalyst was very important in this regard. However, it was not focused on strengthening institutional capacity to carry out these linking roles in the future.

o Developing effective working relationships with farmer organizations is possible through the catalyst approach, both where such organizations already exist and where they must be formed. The catalysts played an effective role in stimulating action-oriented initiatives. However, in SCOR the catalyst did not contribute significantly to--and in some cases may have undermined--self-reliance within farming communities. This is, in fact, the fundamental base for their sustaining positive changes, and should have been the catalyst's key and most important contribution.

In their work with farmer groups and organizations, catalysts may have inadvertently created a pattern of muted paternalism which line agencies could adopt without great increases in resources or changes in habits. Nonetheless, this pattern could lead to broader and more frequent, and eventually improved, communication with farmers. It is possible for the GSL to visualise, in future programmes without being donor funded. Although unlikely to be sufficient for activating significant change in existing patterns of resource use in the near term, it could create a more favorable environment for future efforts. The failure of the catalyst role to reach its full potential was undoubtedly affected by the heavy emphasis on achieving end targets of landscape changes within an unrealistic time frame. A more effective approach is possible if there was a linkup with local bodies and groups.

o The linkages formed and improved through SCOR interventions--both between leaders of farmer organizations and government officers, and also among resource management officials and

district, provincial, and national levels--were effective in helping improve watershed management. The linkages at the provincial and divisional levels in NWS appear to be functioning particularly well (see Figure 5, above).

VII. PROJECT MANAGEMENT IN INTEGRATING POLICY, INSTITUTIONS, TECHNOLOGY AND RESOURCES.

As designed, primary responsibility for SCOR's management was given to the Ministry of Irrigation, as a responsibility shared with other ministries through a National Steering Committee. At the provincial level, Provincial Steering Committees were to provide complementary guidance for their respective pilot watersheds.

Primary responsibility for direct implementation was given to IIMI. The initial conceptualization of SCOR had been prepared by IIMI, based on a participatory process led by senior government officials appointed by the Secretary of the Ministry of Irrigation. The result of this process was an innovative approach to increase productivity through granting security of tenure to farmer resource users. Because it was a research institution, in some quarters the action research and development orientation of the project led to doubts regarding the appropriateness of IIMI taking the management role.

During the course of implementation, the original conception and common understanding of the project gradually changed. As primary implementor, IIMI had a major task in ensuring that the National Steering Committee continued to understand the project as it evolved. The NSC brought together other agencies such as the line agencies of the Government of Sri Lanka, including the Ministries of Irrigation & Power, Agriculture & Lands, Environment & Forestry together with Government of Sri Lanka Boards, such as the Tea Small Holders Authority, and USAID, all of whom were involved in integrating policy, technology, and resources. At the provincial level, representatives of these institutions (in the Huruluwewa and Nilwala watersheds), district level councils, and NGOs. At the political level, members of Parliament and provincial councilors also showed interest.

In this hierarchy of Project Management these institutions--the National, Provincial and District Steering Committees--should have played a very significant and vital role in ensuring inter-institutional linkages and giving direction affecting the coordination with respect to institutions, technology and resource use, and guiding SCOR in its future role and strategies. However, as one Provincial Agriculture Secretary noted, despite the fact that, more so than on any other project, we had the thinking that this is our project, ... we were not forceful in trying to change the project. The role and authority of the provincial level, he felt, were not well defined. At the national level, similarly, some officials had the feeling that it was an IIMI and USAID project, not a project under the GSL's overall guidance through the National Steering Committee.

As chief implementor, IIMI's lead role and commitment was successful, and essential, in getting the project off the ground. IIMI was effective in getting the Team Leaders and staff in place and liaising with relevant institutions. Although the MTE report noted that there have been no project management problems of note, the final evaluation team was given indications that problems were surfacing at that point (early 1995), both within the IIMI implementation team and in the NSC. IIMI eventually took steps to correct the management problems, and during the last year of the project, put considerably more emphasis on consolidating policy, institutions, technology, and resources. In addition, by the time of the May 1995 NSC meeting, a lack of consensus on some major points of the project's strategy for sustainability was also clear. In part because of its management weaknesses, IIMI's effectiveness and efficiency was limited, resulting in ineffective direction being given by IIMI.

Guidance from the National Steering Committee was felt in both watersheds. In addition, impact was felt by farm groups due to the improved coordination carried out by the line ministries and authorities both in HWS and NWS. Government policies were also changed in a number of instances, through effective linking of field experience with the national-level decision-makers. Many of these were cabinet decisions which allowed specific innovations to go forward. Such quiet changes of

policy provide a useful base of experience for wider policy changes later. Details of SCOR's contributions to policy change are provided in Figure 6. In the early stages the NSC was quite action oriented. However, following the MTE, the Committee was unable to come to consensus on the recommendation that a viable mechanism be adopted to phase out SCOR and support user groups so that implementation could be carried out without interruption.

SCOR did not set clear priorities for its research or its implementation. Project reports and documents demonstrate a concern with whole range of complex, interacting factors upon which watershed management depends. From the standpoint of understanding the system, such a concern is correct: to arrive at correct conclusions, one must take into account a vast number of factors. As SCOR brought together more and more data, however, it did not distill out key patterns and select points on which to focus. It omitted key exercises (e.g., the MTE's recommended analysis of the costs and benefits of key innovations) which would have helped it to do so.

Conclusions

- o The system of carrying out coordination and linking policy decisions more directly with local-level (e.g., user organization) experience is sustainable. It's sustainability has been enhanced by the process of devolution of governmental action to the provincial level.
- o The mechanism of the Steering Committees--at the national, provincial and district levels--could remain in place. Such committees would play useful roles in guiding and supporting Sri Lanka's overall development strategy and integrating follow-on activities (e.g., the proposed ADB project in Nilwala watershed or similar efforts).
- o The specific purview of each agency with respect to the project was left implicit. This may have contributed to later disagreements noted below. In general, the degree responsibility granted to each level was not an issue. Linkages between the divisional/provincial level and the central level were effective in fostering policy change.
- o The role of IIMI in carrying out project implementation was too resource intensive to be sustainable. Key functions could have been transferred to line agencies or to NGOs. That project decision-makers were unable to come to agreement on how best to do this is regrettable.
- o Far from balancing one's attention well within a vast array of factors, SCOR's failure to explicitly choose certain lines and abandon others early on--left it ill-prepared to choose when the decision was made to end the project earlier than many had expected.

- o The policy of granting user rights where possible to users who protect state lands/reserves with production/conservation plans until the promulgation of necessary legislation was accepted after the project involvement in this area
 - o A cabinet decision was made to reorient the functions of the Irrigation Management Division (IMD) to include watershed management tasks in their program of work. Project staff collaborated with IMD to design watershed management plans for IMD project areas of Dewahuwa, Ingimutiya and Mee-Oya basins under this new initiative. However, implementation in selected watersheds has not yet materialised.
 - o Project interventions in the Mahaweli Feeder Canal area demonstrated the advantage of making land and water use decisions by farmer organisations to safeguard common interest. A cabinet decision has formalised these arrangements by transferring the area as a special project area under the Mahaweli Authority. The Mahaweli Authority has already appointed a Residential Project Manager for the Huruluwewa Feeder Canal area.¹
 - o The Department of Agrarian Services took a policy decision to allow registration of Resource User Organisations and Federated Farmer Organisations, based on sub-watersheds, even though the organisations' areas of operation are not co-terminus with administrative boundaries.
 - o Due to the facilitating role played by the project with Tea Small Holders' Societies (TSHS), the Tea Small Holding Development Authority (TSHDA) initiated a resolution by the parliament giving body corporate status to TSHSs. Tea societies were empowered to form tea banks to address problems of access to capital.
 - o The southern provincial council has endorsed policy support for the development of micro-hydro power projects for electricity generation as well as catchment protection following project intervention in Bovitriyadola micro-hydro electricity power generation.
- Following the experiments in Huruluwewa and Nilwala watersheds, formation of farmer companies has been accepted as a government policy. The government provides a range of concessions to newly established farmer companies to compete with private sector business establishments. The companies may assume some functions previously carried out by state sector corporations/boards such as the Paddy Marketing Board and the Cooperative Wholesale Establishment.

Source: IIMI/SCOR

Figure 6 : Policy Initiatives Supported by the SCOR Project

¹ There are unconfirmed indications that Mahaweli may withdraw from the Huruluwewa Feeder canal.

Table 6 : Selected Process and Resource Management Innovations under SCOR

Process Innovation	Resource Management Innovations (partial list)	Sub-watersheds
Granting of land use rights on chena and encroached lands	Agroforestry (long-cycle timber crop interplanted with annual crops for first 4 years); contour bunds	Huruluwewa: 28 sub-watersheds; 6 focal areas subwatersheds Nilwala: 8 sub-watersheds; 4 focal areas
Granting of tree tenure rights: (streamside and roadside reservations)	Fruit tree planting (mango, banana, citrus, coconut, etc.)	Nilwala: All 4 focal sub-watersheds Huruluwewa: all 6 focal sub-watersheds
Integrated planning with line agencies and resource user groups	Home gardens: fruit tree planting; compost and organic matter recycling; contour bunds and ditches; mulching Livestock: breed improvement and animal distribution Beekeeping	Nilwala: All 4 focal sub-watersheds Huruluwewa: all 6 focal sub-watersheds
Resource user groups	Same as above, and also Mushroom cultivation (training) Medicinal plants Mini-hydro Jak/breadfruit processing (drying)	
Farmer companies	Maize and soya production Milk processing and marketing Treacle processing and marketing Anthurium production and marketing Chili; onions production and marketing Fertilizer, seed, and other inputs Business management skills	Huruluwewa: Kalundewa Nilwala: Diyadawa Thenipita, Nilwala: Horagala Nilwala: Kiriwandola Huruluwewa: Kalundewa Huruluwewa and Nilwala Huruluwewa and Nilwala
Tea societies and Resource user groups, in collaboration with tea plantations	Tea land productivity: infilling, fertilizer application, pruning, shade management, soil and moisture conservation	Nilwala: Anninkanda, Diyadawa Thenipita, Horagala, Milla Ela sub-watersheds
Service farmer organizations for input supply and technical advice	Weed and pest control, fertilizer application	Nilwala
Farmer organizations	Integrated water management: feeder canal, tank and wier system management, ground water use	Huruluwewa
Land consolidation through farmer organizations	Paddy management Tank system management	Nilwala Huruluwewa

- o Government policy with respect to the feeder canal system for diverting Mahaweli water into the HWS. is sustainable and operative.
- o The participatory process through which SCOR was designed, and begun with such optimism, was not carried through in implementation. In particular, the National Steering Committee's common vision of the project gradually fragmented. In any event, it was not given powers commensurate with its key oversight responsibility. The most striking result was its failure to guide project redesign at the key junctures of the post-MTE redesign and the end-of-project phase-out.
- o SCOR did not make effective use of MTE recommendations which would have helped it to reduce its complexity and the scope of its objectives, enabling it to concentrate on a few key priorities where returns to the project's eventual \$4.8 million investment were most likely.
- o Inexperience in this type of project limited the project's impact. IIMI did not provide effective support through its access to international, and possibly even national, experience of relevance. Key elements of experience include management experience necessary in complex institutional and implementation settings. Research experience alone is not sufficient.
- o SCOR was effective in laying initial groundwork, through developing many useful innovations in organizations, policies, resources, and technologies. It was not always efficient in so doing. A significant error was the attempt to expand and replicate too quickly, before the elements of the model were clearly understood by those involved in the replication. USAID's and the government's pressure on SCOR to achieve quick and widespread results contributed to this error. The National Steering Committee's acceptance of IIMI's final year's work plan, with its realistic reduction of targets, helped correct this error at least for the final year of the project.

VIII. RESULTS. RESULTS

A. User Control of Natural Resources through New Institutional Structures.

Conclusions

o SCOR has created a considerably greater awareness and common understanding of the importance of watersheds and conservation. SCOR has helped reinforce a sense of stewardship and responsibility among some public and private leaders with respect to creating a wider public good through investments which are longer term and/or more distant from their immediate constituencies. This is neither an easy nor a complete accomplishment, given narrow and pork barrel interests which threaten devolution; it is an important one.

o SCOR contributed to policy changes which created openings for positive changes in watershed management through increased user control of natural resources (see Figure 6 in the preceding chapter). SCOR also helped develop institutional innovations--both forms and mechanisms--which could take advantage of these openings. These have operated well at the project level. In addition, the concept of farmer companies in particular has been enthusiastically adopted by the Department of Agriculture. It is not clear that these contributions to institutional capacity are yet strong enough to be sustained.

B. Productivity and Conservation.

Conclusions

Impacts of Productivity Improvement and Conservation of Productivity Improvement and Conservation

- o The main impact expected from productivity improvement was increased farm income, thereby reducing poverty and the pressure for unsustainable use of natural resources. With some exceptions, most of SCOR's activities under the productivity component will yield positive impact only in the mid- to long term.
- o Home garden development component has a positive impact on the farming system in terms of ecological improvement giving multi-layer-cropping system, preservation of biodiversity, stabilise the micro-climate of the home garden, and recycling of organic matter.
- o Increase conservation of forest areas will negatively impact on expansion of tea smallholdings.

Impacts on Sustainability

o Continuous intervention is necessary to maintain production and conservation standards of the home garden that were established. Without effective extension and advisory services easily available sustainability will be hindered. The continuation of home garden level soil conservation methods is doubtful, for reasons detailed in Annex 7. Interest in conservation of forest, stream reservation and road reservation will be sustained as long as there is adequate marketable production from the total land under the command of the family. If this objective is overlooked, which is likely for many farmers in Huruluwewa Watershed (HWS), the expansion of conservation efforts will not be maintained.

C. Participation in the Market Economy

Conclusions on Impacts

Opportunity to increase income is the main incentive driving farmer adoption of innovative practices. Increased interest in specific innovations has been greater for those crops or products where farmers see the greatest opportunities for quick, direct benefits. Farmers see marketing as their main problem in organising their agricultural activities as a commercially viable venture. The main issue they face in marketing is inadequate prices for their outputs, given the high prices for inputs. The introduction of farmer companies trading both inputs and outputs has facilitated marketing. The fertiliser corporation and agro-chemical companies provide inputs at lower prices for farmer companies as a policy, and the companies have passed a major part of the price advantage to the farmers.

Sustainability

o The sustainability of farmer companies as business ventures will greatly depend on the financial viability of the companies. Company accounts suggest that Huruluwewa Farmer Company and the Nilwala Agro-Product Farmer Company have financial stability to continue. The two farmer companies in NWS have a broad base product range to diversify their business. However, the Huruluwewa Farmer Company has a narrow range of products and has depended heavily on a few government contracts. The sustainability of the company thus greatly depends on the continuity of these contracts.

D. Incremental Net Benefits due to Increased Productivity and Conservation.

The main impact expected out of productivity improvement and conservation is to increase the net benefit to the farmers as well as at the programme level. The main component that could contribute to net benefit increase in the short run that of annual and semi-perennial crops such as banana, lime and lemon in home garden and soybean and maize in the upland. The indicative financial analysis of a typical home garden model presented in Annex 8 showed a very low net present value of Rs 5,800 for a period of 10 years and 28% IRR. The IRR analysis focuses only on the production aspects, not taking the conservation aspects into account due to lack of reliable data. Farmers with high subjective discount rates (i.e., who give a higher value to activities which provide an income in the short-run) would prefer to have production activities with an IRR higher than 28%. This would mean inclusion of annuals, semi-perennials and high-income crops in home garden models. The resource poor farmers need a short-term income, which is lacking in the productivity component of SCOR (see Annex 8).

The other incremental net benefit will come from the participatory forestry programme. This will yield positive impact only after about 15 years as many trees planted are forest timber trees. The soil conservation programme will increase the productivity in the long run and yield a net benefit only if the conservation practices will sustain for a sufficient period. The information needed to calculate incremental benefits in the conservation areas is very demanding and not available at the watershed level.

A survey conducted by SCOR has revealed that the green tea leaf production of the sampled area has increased from 852,467 in 1994 to 904,440 in 1996 NWS. This 6% production increase can be mainly attributed to the intervention of SCOR according to the tea smallholders as well as SCOR catalyst. The net value of tea green leaf is assumed at Rs 10 (deducting the cost of production), and accordingly the net incremental benefit of tea improvement programme is about Rs 500,000 per year at the programme level.

Overall conclusion: As indeed should be expected in any pilot effort designed to develop innovative responses to resource management problems and opportunities, the vast majority of the innovations SCOR has tried out have not been adopted. They have not been adopted because they fail to provide sufficient net benefit sufficiently close at hand--in time or space--to the farmer. Nonetheless, mainly through support to farmer organisations and innovations in organisational forms, SCOR has opened up new income options for farmers.

Recommendation

- o The potential for income generation of conservation-oriented farming systems in home gardens of HWS and NWS and tea land in NWS, and stabilised *chena* cultivation with an agro-forestry component in HWS should be investigated. The analysis should assess the resource base required, economic viability of cropping systems, employment generation potential, and marketing aspects. If these factors are satisfactory in terms of farmers requirements, the conservation oriented farming systems could be considered as sustainable and replicable.
- o As income generation is essential to reduce the pressure on conserved land, marketing opportunities should be explored for fruits that will be harvested in conserved forest, stream reservation and home gardens, and other non-timber forest products. The farmer company structure could be utilised in this arrangement.
- o Income generating or some other essential service component should be linked with the conservation programme to motivate farmers to undertake conservation.
- o A farming system approach involving resource users should be adopted, to diagnosis and develop, among other aspects, the most suitable soil and moisture conservation practices for an individual farm. Inappropriate methods have not been accepted or even if accepted were not sustained.

IX. LESSONS LEARNED. LESSONS LEARNED

- o Identifying meaningful policy change is enhanced through field level interaction with resource users, which helps identify more clearly their constraints and objectives. SCOR's quiet policy changes, such as cabinet decisions, permitted innovative mechanisms and practices go forward, while allowing policy makers to observe results and make adjustments before enacting a policy on a wider basis.
- o SCOR's difficulty in progressing towards key sustainability objectives suggests that end result targets or indicators are not adequate for undertakings as complex as watershed management. Some measure of incremental progress towards improved management capacity may be necessary. A phase-oriented framework of incremental benchmarks may help a project better achieve objectives of moving key initiatives from a project to a program mode. Annex 5 provides an illustrative list of benchmarks that may be useful in assessing improvement in watershed management capacity.
- o The time frame for projects seeking to promote significant change in the way people organize to do things should be designed flexibly, but with key checkpoints. The judgements made at these checkpoints should be well communicated and should not be ignored. Phasing out gradually is more effective than rapid withdrawal in ensuring that changes survive the transition.
- o Quick and direct benefits are still the most effective incentive for adoption of new ways of doing things. Benefit in the form of cash income or savings was the most significant force in bringing farmers together to organize to manage input supply, production, processing, and marketing.
- o Usufruct rights for both land and trees provide incentive for investing in resource management. Supporting technology (even simple know-how) and inputs contribute to a stronger sense of ownership and improved land use. Thus, a programme which address tenurial rights should also be accompanied by a package of technical assistance for improved land use.
- o Each component of conservation technology should be simple and fit well with local available resources. Blanket recommendations for widely varying parts of a watershed are not likely to result in widespread or sustained adoption.
- o Farmers linked successfully to markets had the best developed spirit of self-reliance and sense of can do self-confidence. Successful linkage to markets depends on organizing production and a viable financial base as well as the market links themselves. Farmer companies should avoid basing commercial activities on too narrow a product base. Product diversification, though, can be based on a single crop, but with different processed products.
- o Farmer organizations at the secondary level are effective in improving communication between farmer leaders and line agency officials, leading to greater satisfaction with line agency programs on both sides.
- o SCOR's experience with resource user groups showed that farmers will organize effectively at the primary level around specific objectives. The project's lack of success in building on the initial achievements demonstrates the importance of organizing project support around specific interests and common objectives of local people.

- o Institutional mechanisms must serve farmer needs and should not be multiplied. Too many organizations at the farmer level promotes apathy and doubt among local people, thereby retarding effectiveness.
- o The primary role of the catalyst is to promote self-reliance. SCOR's weakness in safeguarding this primary role clearly suggest that:
 - Considerable care and attention are needed to ensure that alternate roles do not undermine this fundamental role;
 - Adequate training in concepts, strategies, and methods is essential; and
 - Guidance and direction by an experience social scientist/practioner is important.
- o Too narrow a mix of expertise or function, or too little interaction with outside perspectives, limits impact and replicability of a project team's efforts.²³ Connecting people with each other and multiplying leadership helped generate ideas and enthusiasm to make things happen.
- o Informal relationships at different and across levels can be more dynamic than the formal committees. Informal relationships between project staff and decision-makers were as important in shaping project decisions and gaining commitment for project activities as the National Steering Committee or the Provincial Steering Committees.
- o Research institutions may not have the strong and flexible administrative capabilities required for carrying out complex implementation projects and should be aware of their limitations.

²³In this regard, the aspects of mix include the mix of international and local staff, the mix of disciplines, the mix of backgrounds (e.g., public or private or NGO sector, administrative or technical department, etc.), and the mix of functions within the team, the mix of staff from one site and another, and the mix of staff at various levels with target stakeholders at various levels.

X : ISSUES AND OPPORTUNITIES: UNFINISHED BUSINESS : ISSUES AND OPPORTUNITIES: UNFINISHED BUSINESS

A. Programme Implementation

The original aim of the SCOR project was to transform itself from a project mode to a programme mode. What should be possible is for certain important elements to be implemented in a programme mode. This would undoubtedly depend on the agency that would inherit the concepts and the concepts and strategies of the SCOR project.

The SCOR Project used efficient and sophisticated tools of planning such as data collection, mapping, GIS, process documentation and research. As pointed out in the MTE less sophisticated well yet effective tools such as rapid appraisal could be used effectively. For example data collection and process documentation which are valuable tools could be replicated in other projects with the proviso that the data should be analysed and made use of for planning purposes without letting the data accumulate and gather dust. The process documentation is another valuable tool that has proven valuable in other countries for correcting direction and dimension of the development process.

The concentration of technical financial and material resources available in the SCOR project made possible an intense and high quality service to the community. Financial incentives to both officers and resource groups made possible quick results. It may not be possible to replicate activities in the same mould but in a lesser intensity it should be possible to concentrate on quality of activities than be forced to achieve set targets.

Financial incentives motivated many Resource User Groups to undertake certain development and conservation activities on temporary basis. In replication it should be possible for groups involved in the same activity to form an organisation and obtain legal recognition. What happens in the SCOR project was that the group disintegrated when the activity was completed and valuable opportunity to form legally recognized associations was lost. In Nilwala watershed some of the resource groups have been made into an organisation such as mini hydro scheme societies and collection of Kitul jaggery (made into a company). This pattern could be tried elsewhere.

The role of catalyst is that of an enabler, facilitator and motivator and not that of a leader, officer or regulator. The role of the catalyst particularly in Huruluwewa resulted in creating a dependency of the farmers on the catalyst. This does not mean that the catalyst role is not valuable. With proper training and understanding of the role it should be possible for the catalyst to play a useful and valuable role in facilitating change and positive development.

B. Research, Learning, and Adaptive Learning

SCOR has initiated a number of new strategies and planning approaches for increasing shared control of natural resources, and linkages for commercialization. There was enormous potential to carry out various types of research studies, of both academic and action-research interest. However, efforts were not focused to obtain substantial research results during the project period due to the following reasons:

- o Although there was a research plan included in the programme description, the well set out objectives were not used to guide the conduct of research.

- o A variety and a volume of data have been collected at the field level but with a very little focus or orientation towards a particular objective.
- o Communication between data collectors and the analyzers or researchers was limited thereby creating a situation where the data collectors had insufficient insight as to why and how data was being utilized.
- o The issue for the future is that the situation created by SCOR has provided enormous potential to explore a variety of interests encompassing the issues of sustainability and replicability as these relate to:
 - o The extent and uses of natural resources for production and protection interests;
 - o Relationships between socio-economic conditions of resource users and the intensity of natural resource utilisation;
 - o The interdependence of decisions made at the farm level, taking into account farm-level resources, as influenced by market forces, availability of credit and/or subsidies, and conservation concerns; and
 - o Optimum scales for natural resource management, on a sustainable basis, by farmers under different forms of organization.

These aspects have both research interest and development interest. The results of such research could be directly used as inputs for formulating watershed-based development programmes. Irrespective of the mode of operation of such projects or programmes in the future, these research and learning issues should be a priority. In fact, IIMI and others have begun to address some of the complex issues of watershed management, as the more recent studies listed in Annex 4 show.

As many new relationships in the areas of land and water use, integration of socio-economic and agricultural aspects have been addressed, the project itself provides a rich ground for academic research. However, a balance should be struck between research *per se* and development oriented and action oriented research. In fact, one of the main issues facing the project was that of balance: between an interdisciplinary **understanding** of **all** relevant factors and concentrated **action** on **selected** key factors.

In this regard, the evaluation team understands that IIMI has gathered sufficient information to carry out a systematic financial and economic analysis of the production and conservation components of the SCOR Project. Given limited time and access to such data, it was not possible for the evaluation team to carry out a meaningful exercise. However (as had been recommended by the MTE) it will be immensely useful for IIMI to carry out such an economic and financial analysis, at least for selected items of SCOR's program.

A volume of data is available on various issues relating to SCOR activities. These data should be organized into a systematic information base and then made available to researchers for meaningful use. The opportunities for adaptive learning lost during the project period should be exploited and carried out.

C. Project-to-Program

The regrettable lack of agreement on how to best move from a project to a program has its seeds in the habits and interests of a small but powerful subset of the project's key stakeholders, the central-level institutions which sat on the National Steering Committee. The representatives of these institutions had overall responsibility for the project and specific responsibility for ensuring that a feasible plan for moving from a project to a program mode was developed and at least begun to be carried out within the ample time (three and one-half years) between the Mid-Term Evaluation and the end of the project.

Even though SCOR has come to an end, it created value through developing and supporting a great many elements of change which had positive impact and could be sustainable with modest additional support. The National Steering Committee should continue to work together until it has agreed upon appropriate mechanisms for providing this support and for extending the results.

Two useful steps would be (a) the clarification of the elements of change and key functions required to support these, as described in Section A, above, and (b) the distillation of key understanding and lessons learned, as described in Section B. The National Steering Committee could proceed, however, before these steps are carried out by commissioning an in-house study to provide an analysis of current relationships and interests among government and other agencies regarding the key themes of the project--shared control, state-user partnerships, etc. The analysis should:

- o Assess explicitly the strengths and weaknesses of existing resources, programs, policies, and management of these institutions in these theme areas. The analysis should also include the institutions previously considered by the NSC.
- o Propose, on a tentative basis, specific roles and responsibilities of these agencies, and their respective level within the agency, with respect to the specific themes, based on institutional capability, legal authority, and credibility for addressing the issues involved.
- o Propose specific action areas (thematic and geographic) where agreements might be formalized between two or more agencies.

Following the analysis, and review of due progress in the first two steps mentioned, the NSC should complete its unfinished business--designing and implementing:

- o An appropriate framework for oversight of watershed management issues which cross administrative boundaries; and
- o A plan for effective inter-agency collaboration on specific actions in key theme areas.

The evaluation team recommends that watershed implementation programs be designed and carried out at a subwatershed level, except for the specific issues that go beyond subwatershed boundaries.

ANNEX 1 TERMS OF REFERENCE FOR THE FINAL EVALUATION

TERMS OF REFERENCE

SHARED CONTROL OF NATURAL RESOURCES (SCOR)

FINAL EVALUATION

I Background

The Shared Control of Natural Resources (SCOR) sub-project under the Natural Resources and Environmental Policy Project (NAREPP) was planned as a six-year U S \$7 0 million activity to assist Sri Lanka to sustain the productivity of its land and water resources within selected watersheds through shared control of those resources with local user-groups. The project design was based on concern over a lack of clearly defined tenurial rights of small farmers to land, water and other natural resources. The tenure status influences productivity and conservation of natural resources. The Project was intended to be a 'pilot' program to test methods for intervention and to identify policy reform issues for Government of Sri Lanka (GSL) consideration.

The SCOR sub-project adopts a methodology which has been used in other natural resources management approaches in Asia and particularly in water management in Sri Lanka. building small, local organizations around the use of common resource using "catalysts" backed up by experienced specialists, on-site training and support of local authorities. This institutional effort, facilitation, training and dialogue has proven to be essential to identify common interests, coalescing group dynamics and developing new incentive structures. In addition, drawing economic, technical, political and informational resources from external sources are also important to this organizational process. Therefore, SCOR consists of a substantial level of Sri Lankan specialist assistance to provide technical, organizational, financial and training services in four sets of activities.

The SCOR sub-project was approved on March 24, 1993 under an amendment to the NAREPP Agreement. Subsequently, USAID signed a US \$2 53 million Cooperative Agreement (CA) with the International Irrigation Management Institute (IIMI) on May 24, 1993 for the implementation of the initial phase of the project. SCOR is implemented in two phases. Phase I was for 2 years, covering the period October 1993 to October 1995, with full operations in two pre-selected watersheds, Huruluwewa and Nilwala located in the North Central Province and Southern Province of Sri Lanka, respectively. This evaluation is the second of two scheduled evaluations to be carried out on the SCOR sub-project. The first was a mid-term evaluation, conducted between January 28 and February 25, 1995.

which reviewed progress and lessons learned and provided necessary guidance to make SCOR more effective and efficient. The evaluation provided guidance for the second phase of full operation of this sub-project. The evaluation recommended that SCOR be extended into Phase II for 4 years covering the period November 1995 to October 1999. Although Phase II was to end in October 1999, the NAREPP Cooperative Agreement (CA) was scheduled to end on September 30, 1998. The second evaluation will be the final evaluation which is scheduled to be conducted around the Project Assistance Completion Date (PACD) of September 30, 1998. The estimated duration of this evaluation will be one month beginning around mid-August. This final evaluation will concentrate on impact, sustainability and lessons learned among other aspects.

Sub-project activities are being carried out through watershed working groups or water resources management teams at the local level made up of local officials and representatives of user groups. These teams are guided by the provincial steering committee chaired by the chief secretary to ensure inter-disciplinary and inter-project collaboration. At the national level a steering committee consisting of several government ministries, non-governmental organizations, implementing organization representatives and USAID officers are providing national focus for monitoring project activities and policy dialogue and directions.

The SCOR sub-project was planned with a budget of U S \$7.0 million from USAID and U S \$3.135 million from the host country. The IIMI/USAID Cooperative Agreement provided an estimated LOP budget of \$5,995,800 and Sri Lanka Rs 22,875,000/- (PL480 Title III Local Currency funds). The total amount of funds provided to date is \$4,860,000 and Sri Lanka Rs 22,875,000/-. However, due to USAID's current revised country program strategy and the resultant reduction in the number of Strategic Objectives (SO) and the consequent and drastic reduction in funding and staffing, additional funding was not available. Under these circumstances IIMI and the GSL were forced to re-think its approach and it became necessary to decide on future options for SCOR. IIMI and the GSL had to decide quickly on how best to use the remaining, limited funds both to document and validate the results of SCOR's innovative approach and also to institutionalize and replicate to the extent possible the positive outcomes and capacities of the SCOR Project. After long deliberation it was decided that the SCOR Project would be continued until the end of September 1998 using only the funds already made available for the project. The proposed activities and outputs are presented in a Workplan. The CA was modified to incorporate the following changes:

- (1) the Total Agreement Cost is amended from \$5,995,800 and SL Rs 22,875,000/- to \$4,860,000 and SL Rs 22,875,000/-

- (ii) the budget line items are re-allocated within this revised total Agreement cost of \$4,860 000, and
- (iii) a change in the Program Description/Scope of Work resulting from the reduced LOP Budget (Total Agreement Cost) as presented in the Workplan which describes the activities for the closing stages of the SCOR Project

The SCOR sub-project has been a key component of NAREPP and seeks to enhance the share of user control through state-user partnership that contribute to intensified and sustainable agricultural production while protecting the physical, biological and social environments. The main intervention activities in Huruluwewa watershed are

- * Stabilization of chena and encroached lands,
- * Regenerate tank eco-system,
- * Integrated water management,
- * Sharing resources for improved homestead,
- * Ground water development and management,
- * Land consolidation in minor tanks,
- * Organizing user groups/organizations/sub-councils for production, protection and related services

The main intervention activities in Nilwala watershed are

- * Shared management of land and water resources
- * Sharing resources for improving homesteads
- * Improve tea-paddy culture,
- * Organizing groups for improved production protection, marketing and related services,
- * Integrated planning and coordination

Since the inception of the project SCOR is believed to have shown good progress. This final evaluation is planned to take place around mid-August 1998 and will concentrate on impacts, sustainability and lessons learned among other aspects as required in the Scope of Work.

II Scope of Work

The evaluator will conduct the project evaluation by (a) reviewing project documents, reports and other background materials and related reports pertaining to Sri Lanka, (b) interviewing project staff of IIMI and USAID, the Ministry of Forestry and Environment, Ministry of Irrigation, Power and Energy, GSL agencies at the Provincial Divisional and at field level users/user-groups banks

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private business persons and NGOs, (c) travelling to the two pilot watersheds Huruluwewa and Nilwala field offices, homesteads, farms and other facilities, and (d) obtaining and reviewing other relevant information from other sources, as available

- A Under the broad scope of the evaluation/review the evaluators will assess
- * the extent to which project objectives have been achieved during the project period by each objective
 - * the extent to which research has furthered the project objectives
- B Under the specific scope of evaluation/review the evaluators will
- * assess the degree of achievement of project objectives and targets within the planned project period
 - * assess the effectiveness of the project approach in achieving the objectives (intra project assigning of priorities devising of planning approach and initiation of processes)
 - * evaluate the arrangements and span of project management, within the context of integrating the four focal areas of the project, policy institutions technology and resources
 - * assess the adequacy of internalization strategies, the extent of replication, and the approach adopted as a matter of national policy
 - * value/comment on hitherto and predictable incremental net benefits of the project
 - * test the adequacy of new institutional structures, their conduct and performance in view of the incentives to integrate (market oriented) production and conservation based on a review of research outputs and discussions with collaborating partners
 - * assess whether the above have resulted in sustainable resources user management systems and institutions
 - * assess the contribution of the sub-grant component as an instrument supporting establishment of viable resource user institutions

C Prepare a draft "Project Evaluation Summary"

III Level of Effort

The total level of effort for the evaluation will be as follows

Expatriate Team Leader-

Instl /Development Specialist	30 working days
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Local Watershed/Agroforestry Specialist	24 working days
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Local Sociologist	24 working days
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Local Resource Economist	24 working days
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A six day working week is authorized in-country

IV Qualifications

Team Leader - Institutional/Development Specialist (Expatriate)

- 1 Advanced university degree or equivalent in a field relevant to watershed management with strong background in participatory approaches,
- 2 Minimum 10 years project management or field experience (preferably in a developing country) in forming, strengthening monitoring and evaluating resource user groups, organizations, training, institutional building and related policy issues,
- 3 Experience in implementing and evaluating AID environmental/natural resources management projects including meeting AID evaluating requirements of Handbook 3,
- 4 Analytical and leadership skills to lead a multi-disciplinary team of evaluators,
- 5 Report writing skills

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Watershed/Agroforestry Specialist (Local)

- 1 Advanced university degree in geography/ecology or agro-forestry or natural resources management with focus on land and water management,
- 2 Minimum of 10 years field experience in formulating, implementing, monitoring and evaluating natural resources management projects,
- 3 Experience in practical approaches of ecological principles in conservation of natural resources,
- 4 Report writing skills

Sociologist (Local)

- 1 Advanced university degree in sociology/social anthropology with strong background in participatory approaches,
- 2 Minimum 10 years work experience (in a developing country) in work dealing with social formation, social institutions, social planning and social impact assessment related work in user group formation and participatory approaches,
- 3 Report writing skills

Resource Economist (Local)

- 1 Advance university degree in Agricultural/Resource Economics with strong background in quantitative techniques and natural resources or environmental economics,
- 2 Field experience in watershed management and participatory approaches with user/farmer organizations is highly desirable,
- 3 Report writing skills

V Deliverables

Within four days of arrival in country the team leader will submit, for USAID and the Ministry of Irrigation, Power and Energy (M/IPE) review and concurrence, a schedule/time-line of events leading to the completion of the evaluation

Twenty days after the start of the evaluation, the team leader of the evaluation team will deliver a first draft (10 copies) of the evaluation report to the GSL and USAID. The GSL and USAID will comment on the draft and return the comments to the team leader within 3 working days. The team leader will issue a final report (15 copies) incorporating the Mission's and GSL comments before leaving Sri Lanka and completing the contract. The team leader will ensure delivery of 25 bound copies and a copy of the final report on diskette (in WordPerfect 5.2) before payment for the evaluation services will be made. The team leader will also leave a draft of the Project Evaluation Summary document (AID/W requirement) with the mission before departure.

VI Relationships and Responsibilities

The team leader will be responsible for coordinating inputs from other team members into a cohesive, integrated evaluation. In addition, the team leader will develop the project format and outline with project manager of SCOR sub-project and establish schedule/time-line of events leading to the presentation of the draft report before departure from Sri Lanka. The project manager is located in the Office of Economic Growth. The team leader is responsible to the project manager for the satisfactory completion of the evaluation and the report.

The team leader will work closely with the M/IPE, IIMI field and Colombo staff to complete the evaluation.

VII Logistics

The team leader will be responsible for arranging all in-country transportation, office space, secretarial and other office support, computer equipment and communication service. The team leader will make all the international travel arrangements (in accordance with USG regulations) and hotel reservations.

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Annex 2: Members of the ARD, Inc. Final Evaluation Team

Allen G. Turner is a development advisor and team leader who has designed, implemented, and evaluated complex multi-agency agricultural and natural resource management projects similar in scope to the SCOR Project. In Nepal, he helped line agencies of the Government of Nepal (GON) adopt action-research approaches which developed sustainable, market-oriented opportunities and transformed government support to community groups. These resulted in improved incomes and economic choices for thousands of farm households and the formal transfer of management authority for natural resources to more than 300 autonomous local groups. More recently, he led a coastal resource management project in Central America, establishing working groups of informed government agencies, NGOs, and resource user groups to address key management issues in complex jurisdictional environments spanning seven countries. Mr. Turner holds degrees in anthropology from Yale University and agriculture and rural development from Cornell University.

George Wickremasinghe retired from the Sri Lanka Administrative Service in 1989. He held the position of Commissioner of Agrarian Services and was responsible for the implementation of the Paddy Lands Act dealing with Land Tenure & Farmers Organisations at rural level. He was responsible for the Village Irrigation Rehabilitation Project sponsored by the World Bank in 1981. He was the Additional Secretary of the Ministry of Agricultural Development & Research and was responsible for Administration and Horticulture. He held the position of Chairman of the Agricultural Insurance Board. Since retirement he has been a free lance Consultant and Adviser. His last assignment being Team Leader of the Project reporting on the functioning of the Agrarian Research & Training Institute, Sri Lanka, sponsored by the Sri Lanka Council of Agricultural Research Policy. He holds a B.A. from the University of Ceylon.

Sena Ganewatte is a Sociologist and Institutional Development Specialist. He has served as Sociologist in the Land Commissioners Department and Mahaweli Authority of Sri Lanka. He was attached to Cornell University as the Farmer Organisation Specialist of the Gal Oya Water Management Project. He then served in the Irrigation Systems Management Project and the Mahaweli Agriculture and Rural Development Project in Mahaweli System B. He also served as an Institutional Development Consultant in South India, Nepal and Pakistan. Mr Ganewatte has a Bachelors Degree in Sociology from the University of Ceylon and a Masters Degree from the University of North Carolina, USA.

Anura Herath is a Senior Agricultural Economist of the Department of Export Agriculture under the Ministry of Agriculture and Land with 10 years experience in the field of agriculture and resource economics. He also served as a Lecturer in Agricultural Economics at the Postgraduate Institute of Agriculture. He is directly involved in developing, monitoring and evaluating of farm development programmes and also assists in policy formulation for the spice and beverage crop sector. He has a number of consultant experience as a resource economist in the field of forestry, integrated rural development projects, rural water supply and sanitation projects, and poverty alleviation projects. He is a graduate in with a masters in agriculture economics and a doctorate in agriculture economics (1991) from the University of London.

Annex 3: List of Persons Contacted

A. **Central Level**

1. **Government of Sri Lanka**

Jaliya Medagama, Secretary, Ministry of Irrigation, Power & Energy
Ranjith Ratnayake, National Coordinator, Min. of Irrigation
D.M. Ariyaratne, Consultant, Ministry of Agriculture
G.P. Batuwitage, Ministry of Agriculture & Research
S. Wahalawatta, Provincial Land Commissioner, Southern Province
Weerasinghe, D.D. Ag. Extension, DA, Peradeniya
D. Kariyawasam, Additional Conservator of Forests and Project Director, Watershed Management Project.

2. **USAID**

Lisa Chiles, Mission Director
Mohammed Falill, Project Manager
Mohan Siribaddana, former Project Manager
Richard Nishihara, Officer of Agriculture and Natural Resources

3. **IIMI Head Office**

David Seckler, Director General
Randy Barker, Former Interim Director General
Nanda Abeywickrema, Senior Advisor to the Director General
Doug Merrey, Deputy Director General
Ian Makin, SCOR Project Leader
C.M. Wijayarathne, former SCOR Project Leader
R.B. Senakarachchi, Research Coordinator, SCOR
P.G. Somaratne, Sociologist, SCOR
Charles Abernathy
P. Muthukumarana, Training Coordinator
L. Weerakoon, Agro Forestry Consultant

4. **Others**

N.G.R. de Silva, former Director and State Secretary of Irrigation

B. **Huruluwewa Watershed**

1. **Farmers**

W.M.K.A. Dissanayake, Habarana Greenpath Co

S.P.M. Nandapala, Habarana Greenpath Co
S. Suraweera, President, Kelanikawewa Eksath Govi Sangvidhanaya
B. Siriwardana, Secretary, Kelanikawewa Eksath Govi Sangvidhanaya
N. Dissanayake, Treasurer, Kelanikawewa Eksath Govi Sangvidhanaya
K.G. Ranasinghe, Habarana Greenpath Co
I.G. Piyasena, Habarana Greenpath Co
V.G. Ranbanda, Habarana Greenpath Co
K.G. Madduma Bandara, Treasurer, Farmer Org. Fed. Huruluwewa
U.G. Senaratne, General Manager, Huruluwewa Co
W.M. Mudiyanse, Chairman, Huruluwewa Janatha Farmer Co
W.M. Dharmadasa, Director, Board of Directors, Huruluwewa Janatha Farmer Co
T.B. Jayasinghe, Secretary, Farmer Federation, Huruluwewa
U.V. Senaratne, General Manager, Govisamagama
P.B. Ariyawathie, Director, Board of Directors, Huruluwewa Co
W.M.K. Wijebanda, Secretary, Mahasen Farmer Organisation
K.G. Ranasinghe, President, Mahasen Farmer Organisation
S.G. Piyasena, Member, Mahasen Farmer Organisation
S.C. Ranbanda, Member, Mahasen Farmer Organisation
S.T.P. Nandapala, Member, Mahasen Farmer Organisation
S.G. Appuhamy, Member, Mahasen Farmer Organisation
V.G. Chalatha Priyanthi, Member, Mahasen Farmer Organisation
R.U. Jinadasa, Member, Mahasen Farmer Organisation

2. Government of Sri Lanka

Dr Abeykoon, Prov. Director, Animal Production & Health
Karunaratne, Asst. Director Forests, Ex. Provincial Director
Abeywickrema, Chief Sec. Anuradhapura
W. Guruge, Provincial Secretary, Ministry of Agriculture
K.M.P. Wickramatilake, I.E, Huruluwewa
D.S. Ranasinghe, IDO, Huruluwewa Project, IMD

3. SCOR Staff

W. Ratnayake, Team Leader, Huruluwewa
K.G.S. Wijesiri
K.M. Gunaratne, Research Officer
W. Sakalasooriya, Economist SDJS/SCOR
M.P.S. Wijesinghe, Catalyst
W.R. de Silva, Catalyst/Garadiyaulpotha
M. Wimalasiri, Catalyst/Eraula
W.G. Dayaratne, Catalyst/Datuwewa
M.W. Navaratne, Catalyst/Puwakpitiya
K.K. Nihal Ranatunga
W.M. Mudiyanse, Chairman, Farmer Company
H.M. Dharmadasa, Director, Farmer Company
Nihal Ranatunga, Catalyst Livestock Coordinator
T.M.C.K. Tennakoon, Coordinator, Youth & Women s Activities
W.M. Navaratna Banda, Catalyst

C. Nilwala Watershed

1. Farmers

W.M. Edirisinghe, President, Meegaswewa Farmer Organisation
K.B.B. Wanasinghe, Secretary, Meegaswewa Farmer Organisation
N.S.Gunatilake, Treasurer, Meegaswewa Farmer Organisation
P.A. Tikiriappu, Member, Meegaswewa Farmer Organisation
S. Wanasinghe, Member, Meegaswewa Farmer Organisation
T. Gamini, Member, Meegaswewa Farmer Organisation
A.P. Karunasena, Treasurer, Horagala Service Farmer Organisation
H. Karunawathie, Secretary, Horagala Service Farmer Organisation
K.L. Sarathkumara, Finance Manager, Horagala Service Farmer Organisation
Roshan Chaminda Vidhanapathirana, Asst Project Manager
A.R. Gunawardene, Treasurer
W.G. Somadasa, Secretary, Milla Ela Service Farmer Organisation
H.K.A. Indrasiri, Villager
N. Sulanasiri, Chairman, Wijayagama Tea Small Holders Society
M.G. Karunawathi, Secretary, Wijayagama Tea Small Holders Society
D.G. Nayana Kanthi, Treasurer, Wijayagama Tea Small Holders Society
W.A. Hemalatha, Manager, Wijayagama Tea Small Holders Society
H.K. Ajith Prasanna, Project Manager, Wijayagama Tea Small Holders Society
R.B. Dayasili, Committee Member, Wijayagama Tea Small Holders Society
D.B. Chitra, Member, Wijayagama Tea Small Holders Society
W.A. Wilson, Committee Member Wijayagama Tea Small Holders Society
S.A. Chandraratna, Secretary, Beralantara North Tea Small Holders Society

2. Government of Sri Lanka

S.A. Piyasena, S.A.C.A.S. Matara
J.L. P. Jayawardana, D.A.C.A.S. Matara
W. Norman Weerasooriya, D.O. Morawaka
D.K.S. Amarasiri, Divisional Secretary, Pasgoda
A.W. Sarath, Divisional Secretary, Kotapola
A. Weerasinghe, Provincial Manager, Coconut Board, Matara
T.A. Wimalasena, Asst. Director, Agriculture, Matara
B.H. Kumarnayake, Deputy Director, SRDP
S. Wahalawatta, Provincial Land Commissioner, SP, Galle

3. SCOR Staff

Tissa Warnasuriya, Team Leader-Nilwala
R.M. Weerasinghe, Catalyst
G.G.C. Premakumara, Catalyst
S. Kalansuriya, Consultant (Agro Forestry)
J. L.P.Amarasinghe, Marketing Enterprise Assistant

M.D.S. Jayasinghe, Catalyst
B. Pathmasiri, Catalyst
H.M.A.S. Bandara, Catalyst
N.K. Jayasuriya, Enterprise Dev. /Marketing Specialist
Nimal Yapa, Institutional Organizer, Horagala Service Farmer Organization
H.M. Athula Senarath Bandara, I.O. Institutional Organizer

4. Others

K.M. Wilson, Group Superintendent
Mahinda Siriweera, Project Manager
T.K. Piyadasa, Manager & Com. Member, Beralantara North Tea Small Holders Society
K. Dineris, Committee Member, Beralantara North Tea Small Holders Society
Mrs K. Yasawathi, Committee Member, Beralantara North Tea Small Holders Society
Anura V. Ranatunge, Field Director
Ven. Walpita Gunaratne Thero, President, Beralantara North Tea Small Holders Society

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**Annex 5a: Progress towards Improved
Watershed Management: Illustrative Benchmarks for Improved Capacity²⁴**

The following benchmarks are **illustrative** of one approach to measuring progress towards improved watershed management, especially with respect to progress in moving from a project to a program mode, one of the objectives of the SCOR project. The step-wise approach presents an alternative to measuring progress through an incremental increase in the number of outputs achieved towards a set of end-of-project targets. Numerical targets could be set, of course, to measure progress on certain of the critical elements illustrated here. (Please see Chapter II for further background on the stages proposed here, which are illustrative of just one way of addressing the need for balance between **quality** and **quantity** and between **process** and **result** in project which seeks to evolve into a program.

Stage 1: Planning and organization phase: Establishing a database, analysis of current situation, and planning for interventions

Critical element	Yes	Needs improvement	No	?	Not applicable
<p>Has a profile of trends and conditions been prepared for the watershed (or sub-watershed) which assesses:</p> <ul style="list-style-type: none"> o Land and water resources? o Institutions and legal framework? o Socio-economic aspects? <p>Have key program stakeholders both within government and the public identified?</p> <p>Has the assessment been reviewed for technical quality?</p> <p>Have the specific issues to be the focus of the program been identified and selected?</p> <p>Are the major short and long-term social and institutional implications of addressing these issues are understood?</p> <p>Have the project objectives been identified?</p> <p>Have baseline conditions been compiled against which the impacts of program implementation can be evaluated?</p>					

²⁴Freely adapted from Olsen, et al., 1998 (draft), using the stages identified in IIMI, 1992 and 1998b.

Stage 2: Experiments and replication: Action research to confirm the viability of interventions and mechanisms for provision of support

Critical element	Yes	Needs improvement	No	?	Not applicable
Has appropriate scientific research on selected issues been carried out?					
Are significant innovations and mechanisms being tested at a pilot scale? (Specify for each.)					

Stage 3: Consolidation of tested interventions

Critical element	Yes	Needs improvement	No	?	Not applicable
Has the logic or theory underlying each resource management intervention or innovative mechanism been clearly defined?					
Have the important respective stakeholders, both within and outside government, participated in the implementation of each resource management intervention or innovative mechanism?					
Are technical data being gathered and utilised to inform decisions regarding consolidation? Have modifications to the objectives and basic strategies of each intervention/innovation been made as needed?					
Has the project monitoring been carried out as planned?					
Are the steps in the adoption process for each defined?					
Is a realistic strategy for carrying them out in place?					

Stage 4: From project to program : Assistance to resource user groups, government, and other agencies to institutionalize tested watershed management methodologies

Critical element	Yes	Needs improvement	No	?	Not applicable
<p>Has a watershed (or sub-watershed) management plan been prepared that specifies the objectives, policies, methodologies, and actions that will be undertaken for each of the watershed management themes or issues being addressed?</p> <p>Has an institutional structure and the procedures by which management will occur been designed?</p> <p>Has a training program been developed for public and private sector institutions responsible for the implementation of each methodology?</p> <p>Have the costs of program implementation been realistically estimated and the sources of such finances identified?</p> <p>Is the public informed of the issues that the watershed management program is addressing?</p> <p>Have the appropriate non-governmental groups and governmental authorities formally approved the watershed (or sub-watershed) management plan?</p> <p>Have the authorities and institutional arrangements required to implement the plan been negotiated and formalized as a permanent feature of the governance (formal decision-making) system?</p> <p>Have funds and other resources required for implementation been secured?</p>					

Stage 5: Evaluation (may be repeated after Stage 6)

Critical element	Yes	Needs improvement	No	?	Not applicable
<p>Were external program evaluations conducted at major junctures in the project's evolution?</p> <p>Do periodic self-assessments promote learning and adaptation?</p>					

Stage 6: Post-Project Program Implementation

Critical element	Yes	Needs improve- ment	No	?	Not appli- cable
<p>Are modifications to the objectives and basic strategies of the watershed program being made as needed?</p> <p>Are technical data being gathered and utilised to inform management decisions?</p> <p>Are implementing agency staff committed to achieving the watershed management program's objectives and actively support the strategies by which they are being achieved?</p> <p>Do capabilities of implementing agency staff match program needs?</p> <p>Is staff member performance assessed on a periodic basis?</p> <p>Are budget processes, financial accounting and controls, and tracking mechanisms functioning effectively?</p> <p>Is the program's monitoring plan formulated and being implemented?</p> <p>Does the program have political support?</p> <p>Are decision-making procedures known to stakeholders and the public? Are the reasons for decisions transparent?</p> <p>Do major stakeholders actively participate in implementation of the watershed management program?</p> <p>Are mechanisms for inter-agency coordination effective?</p> <p>Are conflict resolution mechanisms being applied successfully?</p> <p>Is necessary infrastructure constructed and/or being maintained?</p>					

Annex 5b: Progress towards Improved Watershed Management:
Illustrative Checklist for Watershed Management Outcomes²⁵

First order outcomes: Successful transition from project to program

- o The appropriate non-governmental groups and governmental authorities have formally approved the watershed (or sub-watershed) management plan or specific element.
- o The authorities and institutional arrangements required to implement the watershed management plan or specific element have been negotiated and formalized as a permanent feature of the governance system.
- o Funds and other resources required for implementation of the plan or element have been secured.

Second order outcomes: Beneficial changes in watershed management behaviors and/or practices

- o Use conflicts are minimized or resolved.
- o Inter-agency conflicts are reduced or resolved.
- o Perception and attitude changes among stakeholders detected.
- o Changes in target group behavior detected.
- o Examples of self-enforcement practiced by user groups.
- o Early implementation actions provide tangible benefits/improvements for stakeholders in the place where they are applied.
- o Infrastructure constructed/improved.

Third order outcomes

- o Evidence of socioeconomic benefits for specific target groups.
- o Land and water productivity and quality shows sign of improvement in selected sub-watershed areas.















Fourth order outcomes

- o Sustainable development within the watershed.

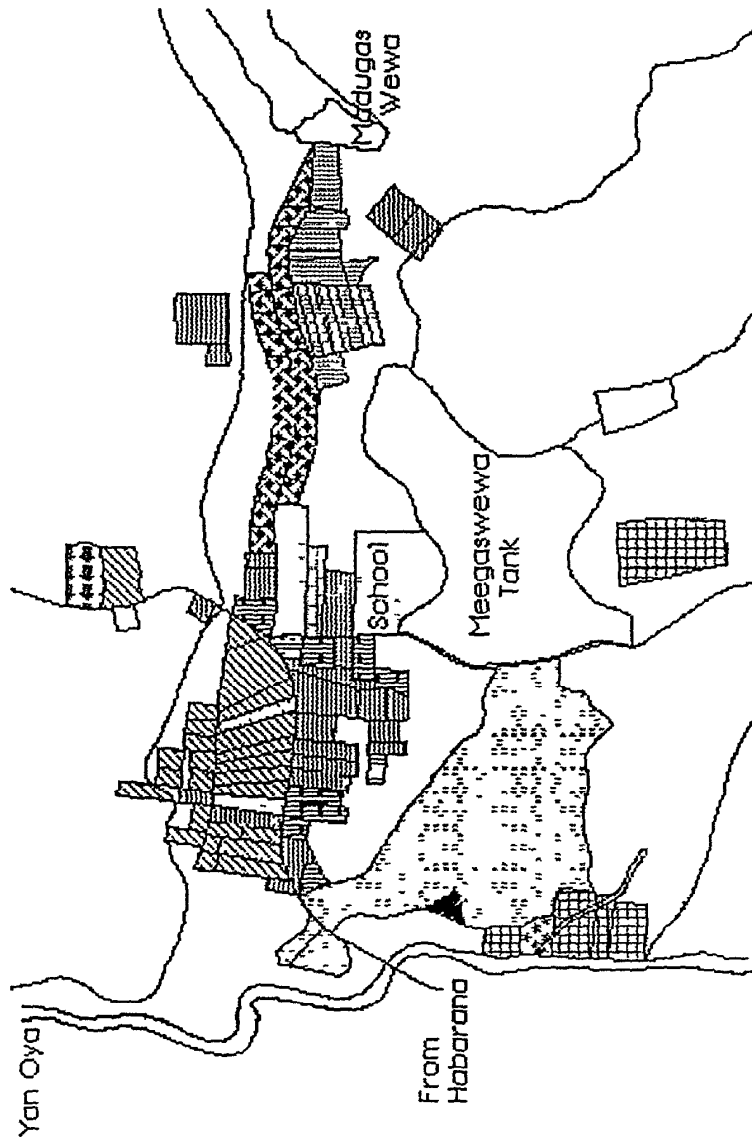
²⁵Adapted from Olsen, et al., 1998 (draft)..

ANNEX 6 MAHAMEEGASWEWA LAND USE

MAHAMEEGASWEWA LAND USE - JANUARY 1994

-  Abandoned chena and scrub
-  Paddy B
-  Paddy & OFC
-  Paddy Maha
-  Highlands NH
-  Highlands B
-  Highlands M
-  Lands of no crops
-  Good perennials
-  Poor perennials
-  Homestead SCB
-  Homestead SC
-  Iluk/Mana
-  Scrub

To Galenbindunuwewa



meters
500

- Chena = Slash and burn cultivation
- OFC = Other Field Crops
- SCB = Seasonal Cropping Both seasons
- SC = Seasonal Cropping one season

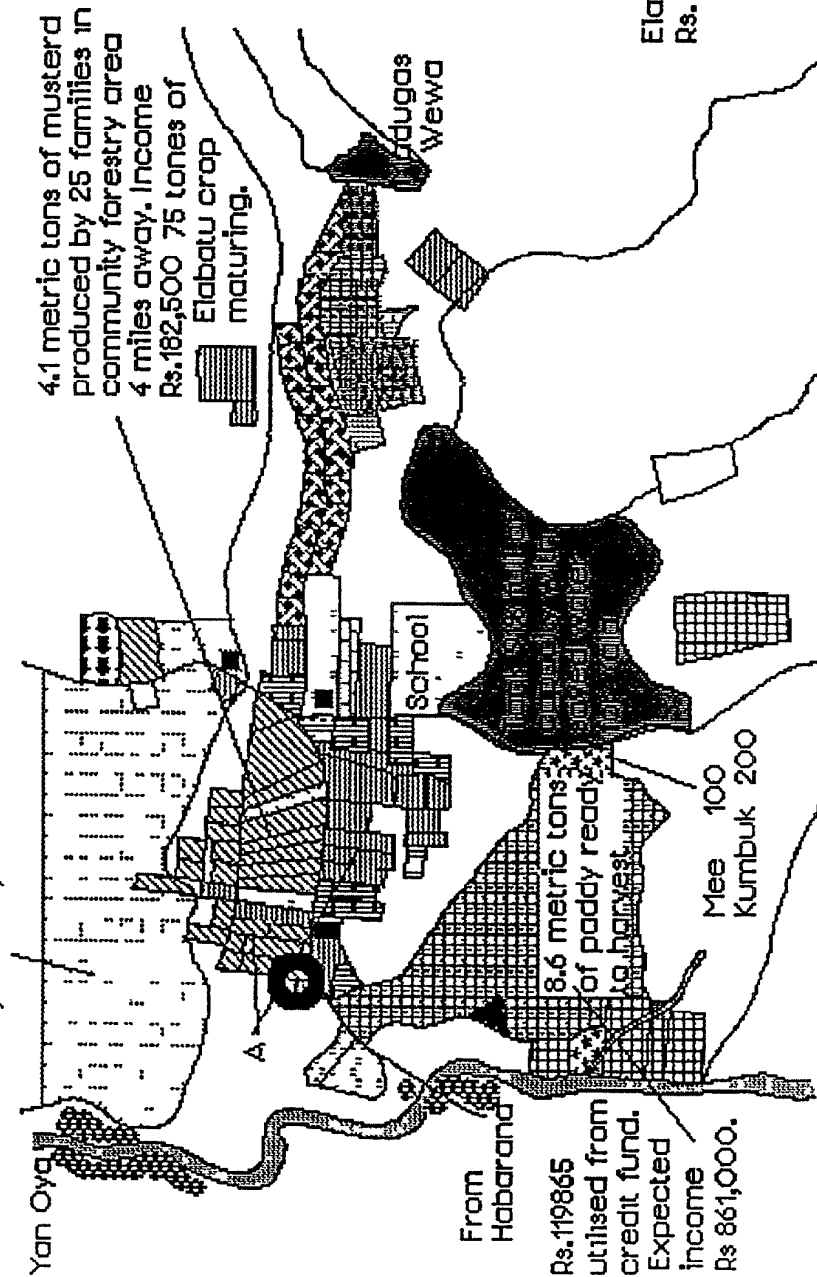
Hurujuwewa watershed IIMI SCOR

Idrisi

MAHAMEEGASWEWA LAND USE - FEBRUARY 1995

60 one acre plots produced income of Rs 183,000
Maize 102,000, Millet 40,000, Chillies 20,000, vegetables 21,000
Plant survival rate 75%
Cashew 700, Jak 150, Teak 575
To Galenbindunuwewa

60 acres of paddy
with yield increase
from 30 to 70 bushels
per acre



Yan Oya reservation
planted with
Mango 95
Cashew 75
Orange 58
Lemon 50
Aricanut 130
Bamboo 90
Guava 72
King Cocanut 35
Survival rate 75%

Illuk/Mana
Scrub

Yala = Dry Season
Elabatu - a local vegetable
Rs. 50 = US\$ 1



Rain gauge
Evaporation pan

Produce collecting centre
Millet and mustard purchase in progress
Huruluwewa watershed IIMI SCOR

A - Homesteads planted with
Coconut 500
Lemon 500
Orange 33
Guava 08
Cashew 25
Mango 105
Neem 200

From Habarana
Rs.119865
utilised from
credit fund.
Expected
income
Rs 861,000.
Mee 100
Kumbuk 200

ANNEX 7 INCREASED FARM PRODUCTIVITY AND CONSERVATION

Findings

One of the main objectives of the project is to increase the productivity of farms. Project aimed at (a) increasing land use intensity (b) intensifying farming systems by introducing livestock, and (c) encouraging soil and moisture conservation with a view to achieving this objective. The activities relating to these aspects were included in the mini-projects that prepared for each sub-watershed in HWS and NWS. SCOR provided a part varying from 25% to 50% of the total cost of these mini-projects to implement specific activities.

A Increased Land Use Intensity

The land use intensity is defined as increasing land area under cultivation over space (i.e. increased number of plants is cultivated in a given time in a given block of land) and over time (i.e. increased frequency of cultivation in a given block of land). In the case of upland, the land use intensity has been increased by cultivating more and more land with the project influence, whereas in lowland, particularly in HWS, cropping frequency has been increased by cultivating paddy in *maha* and other field crops in *yala*. The specific methods adopted and the contribution of them in increasing productivity are outlined below. The project attempted to increase the land use intensity at farm level by implementing the following activities:

- facilitating farmers to develop home-gardens in both NWS and HWS
- encouraging farmers to increase the cropping frequency of lowland in HWS and seed paddy production in NWS
- increasing the productivity of tea land in NWS

Home-garden Development

SCOR Intervention

Facilities provided for home garden development include the following:

Identifying home gardens The project officials with the participation of farmers have prepared land use maps for many sub-watersheds. The team observed a sample of these maps of Garandiya Ulpotha, Meegaswewa, Track-6, Kalundewa, Kalamkawewa sub-watersheds in HWS, and Aninkanda, Diyadawa-Thanipita, Horagala, and Milla Ela sub-watershed in NWS. The maps have necessary and sufficient information for selecting intervention on productivity improvement. On the basis of these maps, SCOR has selected home gardens for interventions. The method adopted by NWS was to demonstrate for the farmers the development activities of selected home gardens and request the participants to adopt the same model.

Identifying suitable crops to be planted Interviews with farmers revealed that the project staff was mainly responsible for crop selection and farmers' participation was only at a marginal level.

Training Farmers of selected home gardens were trained in horticultural aspects of home gardening, compost preparation, mulching and importance of maintaining an adequate crop density.

Organising and linking line agencies to supply planting material The key line agencies participated were (a) Forest Department (b) Department of Agriculture and (c) Coconut Cultivation Board in the HWS and in addition to these (d) Department of Export Agriculture (e) Tea Small Holding Authority, (f) Department of Animal Health and Production and (g) Southern Province Development Authority.

Training organic matter recycling This technology was recommended with a view to reducing the use of chemical fertiliser thereby lowering the cost of home-garden development. Recommendation was to mulch the trees with organic matter. Straw, glyricidia leaves and cadjan are some of the organic matter used for mulching. Use of cow dung and goat dung has also been recommended for the purpose. Mulching has, in addition to the organic matter recycling, an impact on moisture conservation too.

Encouraging the use of compost This technology was also introduced with a view to reducing the use of chemical fertiliser. It was a mandatory condition that each selected home garden should have a compost pit to receive the other inputs.

Progress of Home Garden Development

The target of the SCOR was to develop about 7,900 and 4,788 home gardens in Huruluwewa and Nilwala watersheds respectively. The achievement was 7,765 and 3,788 home gardens as of October 1997 in Huruluwewa and Nilwala respectively (Work Plan Output, 1998). Home garden development is a component of mini-projects. Thus it is difficult to separate out the actual allocation of money or expenditure incurred for home garden development.

Observation on Performance

Selection of crops

Different combinations of trees listed below were provided for the home gardens both in NWS and HWS. The selection of crops for a particular home garden was mainly depends on the availability of planting material. There were no scientifically conducted farming system analyses in both watersheds to guide the catalyst to select most appropriate crops for a specific homestead. However, farmers reported that they were generally in agreement to the type of trees provided.

Type of Trees	Typical number provided per home garden
Mango	5
Lime	10
Oranges	5
Banana	10
Cashew	2
Coconut	10
Jack	3
Teak	10
Acacia	3

The Agriculture Instructors of some of the areas in HWS (for example, Garandiyaulpotha, and Kelenkawewa) and many areas of NWS have participated in selecting the type of trees. Therefore the chances of selecting a wrong crop is very remote. SCOR facilitated in establishing nurseries of papaw and banana in four sub watershed in NWS to supply planting material for home gardens. Service Farmer Organisations and Farmer Organizations of the area provided budded plants of rambutan, durian and avocado in these sub watersheds.

Initiating anthurium cultivation in home gardens is a special component of home garden development programme in NWS. NWS has favourable climatic conditions for anthurium and also the multiple layers crop canopies found in many home gardens provide a suitable ecology for cultivation. Anthurium also helps to minimise the soil erosion while increasing moisture retention capacity. SCOR provided improved planting material and technical know-how through Department of Agriculture and special training programs at Royal Botanical Gardens, Peradeniya for the participants.

Coconut was most widely cultivated in NWS as a home garden crops since it meet the daily family requirement. All four sub watershed in NWS have supported with coconut plating programme with the assistance of Coconut Cultivation Board, the cultivation subsidy scheme and free supplying of seedlings to home gardens.

Crop maintenance and mortality

Since almost all the trees provided are perennial and hardy crops, the maintenance requirements are minimal. However, field observation and farmer interviews revealed that about 50% of the plants are still surviving in HWS and about 75% in NWS. In some case, mammalian pest such as rodents, elephants and wild bores damaged almost 80% of plants in HWS. Elephant damage was very common in areas such as Kelenkawewa and Meegaswewa. Crops such as banana were damaged due to drought in HWS. SCOR recommended and also facilitated pot irrigation¹ for perennial crops in HWS. About 30% of the farmers interviewed adopted this technology. Although this is an appropriate technology, many farmers did not adopt it due to the cost of the operation (farmers were asked to buy the pot at Rs 10 per pot). Pot irrigation system was used mainly for coconut and forest trees but not for banana, limes, oranges and other fruit trees. Thus many of these crops were damaged or showing a retardation in growth due to the effect of drought. Effect of drought is minimal in NWS.

Compost preparation

Although establishing compost pits was a mandatory condition, only a few farmers adopted it in both HWS and NWS. The main reasons for not adopting was (a) digging a compost pit with given specification was a very labour intensive activity as the soil is hard in the area (particularly in HWS) and farmers were reluctant to allocate such a labour input for the composting, (b) some farmers lack technical skills in

¹ A special pot (elongated in shape) was provided to bury near the plant facilitate irrigation.

compost making (c) the method of preparation and the usefulness has not been properly demonstrated to farmers and (d) high opportunity cost of labour in NWS due to labour allocation in tea cultivation. It was revealed that those who prepared compost pits at the initial stage are not maintaining them in both HWS and NWS to have a continued supply of compost. The main reason is that farmers have not realised the importance and economic viability of using compost.

Increasing Cropping Frequency and Productivity of Lowland

Many farmers of HWS did not cultivate paddy lands during *yala* season due to lack of water. They did not have the knowledge and skill to convert paddy field temporary to a field crop cultivation land. SCOR with the help of Agriculture Department officials encouraged farmers to cultivate other field crops mainly soybean, during *yala*. Reliable statistics are not available to indicate the extent cultivated under other field crops in paddy lands in HWS.

A similar condition has not been observed in NWS as both seasons of many paddy lands are generally cultivated. However, the supply of seed paddy has been a problem in NWS. SCOR intervened to ease this problem. SCOR motivated the four farmers organisations namely Ihala Millawa FO, Diyadawa Thenipita FO, Batandura FO, Horagala FO to produce seed paddy with a total grant of Rs 41,000 from SCOR. Representatives from these FO were trained on seed paddy production. These four organisations produced about 200 bushels of seed paddy and distributed. It was reported that the paddy yield has increased from 1127 kg to 2247 kg on average with the use of improved seed paddy benefiting about 250 families in NWS.

Chena Land Stabilisation

Primarily by giving ownership rights and other assistance to the encroaches of forest land for *chena* cultivation, SCOR attempted to stabilise much of the land traditionally under *chena*. The technology used in *chena* stabilisation in HWS is to encourage establishing agro-forestry models, soil moisture conservation practices and organic fertiliser use.

Although statistics are not available to quantify the progress, the discussions revealed that many *chena* lands have been offered a ownership and developed into a stabilised farm plot. In some *chenas* instead of land ownership the user rights of forest trees established were given to the participants. The participants were allowed to use the land for annual crops for the first four years albeit its temporary nature of production. It was revealed that many farmers pay more attention to the production aspects rather than conservation aspects. Under this situation the performance and sustainability of forest trees planted during next decades is a question.

Increasing Productivity of Tea Land in NWS

Tea land including both smallholdings and estates in NWS occupy about 40% of its total land area. Tea is the main income source in the watershed. It is thus important to maintain an adequate level of productivity of tea land while minimising soil erosion. The productivity of many tea lands in NWS was found to be far below the potential. SCOR has intervened through mini-projects concept to increase the production and the conservation level of tea lands in NWS. Tea smallholders were encouraged and trained to (a) fill vacancies in tea lands, (b) replace seedling tea with VP tea, (c) increase application of fertiliser and other micro-nutrient, (d) maintaining a proper pruning cycle, (e) adopt correct lopping and shade control and (f) soil and moisture conservation in tea lands. The targeted extent for development and the developed extent are presented below.

Sub-Watershed	Extent Targeted for Development (ha)	Estimated Extent Developed (ha)
Anninkanda	590	579
Diyadawa Thenipita	545	275
Horagala	203	155
Millala Ela	545	308
Total	1,883	1,317

About 70% of the total targeted area have been developed in NWS. A survey conducted by SCOR has revealed that the green tea leaf production of the sampled area has increased from 852,467 in 1994 to 904,440 in 1996. This 6% production increase can be mainly attributed to the intervention of SCOR according to the tea smallholders as well as SCOR catalyst.

Introducing Livestock

Livestock component was implemented at smaller scale in both HWS and NWS. Mainly goat farming was introduced in HWS and Diyadawa-Thenipita sub watershed of NWS. On average one family was provided with 4-5 number of goats.

Bee Keeping

Attempt to develop bee keeping was observed in NWS. Collection of bee honey from wild colonies in the forest was a common practice in NWS. SCOR introduced scientific methods of bee keeping or apiculture to the area. SCOR linked the line agency assistance for technology dissemination and supply of appliance to the produces. SCOR linked a NGO (*KALANA*) who is engaged in bee keeping development with interested participants in Millawa (Milla Ela sub watershed) and Higurupanagala (Diyadawa/Thenipita subwater shed). NGO provided bee boxes at a subsidised price, material and appliances, and technical expertise. However, the field visits revealed that more attention is necessary to improve the industry.

B Soil and Moisture Conservation in Farms

Several activities have been recommended for farms and other areas of the watersheds for soil and moisture conservation in both HWS and NWS.

SCOR Intervention

Mulching, establishment of drains and contour bunds, and beryl of organic matter in home gardens are the most widely recommended techniques at home garden level in both HWS and NWS. The interventions of SCOR include the following in both watersheds:

- Identifying and recommending the type of soil and moisture conservation methods for home gardens in both HWS and NWS and for tea smallholdings in NWS
- Training farmers on advantages, methods and maintenance of conservation practices
- Marking contours for establishing tree hedges, bunds and drains, particularly in HWS and
- Arranging the supply of planting material for establishing hedges

The adoption of these practices is predominantly observed in only home gardens in HWS, where as conservation practices were adopted in both home gardens and tea smallholdings in NWS.

Observation on Performance of Farm Level Conservation Practices

Selection of Conservation Methods

The MTE commented on the methods adopted, particularly the contour bunds and questioned about the appropriateness and the simplicity of the techniques adopted mainly in HWS. However, there was no change in the methods adopted or the process of adoption of the conservation practices. It appeared that the participation of farmers in selecting methods of conservation is minimal. Farmer interviews revealed that those who used mulch did so mainly because they were reluctant to offend the catalyst so that they would not be deprived of other project assistance. In the case of NWS, adoption of conservation practices was predominantly in tea smallholdings and it was mainly focused on vetiver hedge cultivation.

Adoption of Conservation Methods

Many farmers were aware of the advantages of mulching. Huruluwewa, i.e. (a) moisture retention results in a better growth of plants even during dry periods, (b) the irrigation interval can be made wider with mulching, and (c) some form of fertilising the soil. In Nilwala, the limited observation revealed that the farmers' understanding of usefulness of conservation methods in home gardens is not at a higher level. The following observation were made on the adoption:

- There is no continuity of re-mulching once the initial mulch was decayed in both HWS and NWS.
- Only a few home gardens have bunds at its original shape in HWS. Majority of farmers in both locations was not aware of the technique of marking contours so that they will not be able to re-establish the plant hedge, drains or the bunds. In NWS however, the use of vetiver could still be seen on sensitive edges of some home gardens which are prone to erosion.
- A common observation was that plant hedges were on home garden boundary rather than on the contour in both NWS and HWS, which is not an effective way of controlling soil erosion. MTE has also made a similar observation, but no correction has been done.
- There were instances in Huruluwewa where mulch has been applied on soils with water logging conditions and it has resulted in developing fungal diseases in plants. This is an example of not adapting the technology in the correct manner.
- Several tea smallholdings have ignored the slope of the land and cultivated tea with inadequate soil conservation measures. SCOR has however assisted them in various ways. This type of land use will aggravate the erosion conditions and will affect the downstream with siltation.

C. Conservation of Forest and Stream

Conservation of forest reserves road reservation and stream reservation is a vital component of SCOR. The following table summarises the achievements under this component in NWS (information was not available for HWS)

Extent Developed Under Conservation Programme of NWS

Sub-watershed	Conservation Focus	Targeted Extent (ha)	Extent Conserved (ha)	Number of trees planted
Anninkanda	Conserved Forest	64	16	11 359
	Road Reservations	26	22	520
	Stream Reservation	25	17	10,000
Diyadawa-Thanipta	Conserved Forest	50	1	260
	Road Reservations	25	17	8293
	Stream Reservation	50	25	10908
Horagala	Conserved Forest	391	391	1305
	Road Reservations	20	12	544
	Stream Reservation	28	22	1972
Milla Ela	Conserved Forest	16	4	400
	Road Reservations	19	15	2175
	Stream Reservation	21	9	4029
Total NWS	Conserved Forest	521	412	13324
	Road Reservations	90	66	11532
	Stream Reservation	124	73	26909

The SCOR intervention of the conservation programme is to link the Forest Department to supply technical training and planting material. The Service Farmer Organisations of NWS established nurseries to supply planting material and continue with the planting programme.

Observation of the Performance

- The tem clearly observed the effort taken to conserve the forest and streams and road reservations in both HWS and NWS. However, almost all the stakeholders including paddy and tea farmers interviewed, particularly in NWS commented about the importance of forest and stream conservation.
- Providing use rights to participants in forest conservation activities is very effectively used as a strategy in re-forestation in both HWS and NWS. The considerable progress made in the participatory forestry programme is an evidence for this trend.
- As productive land with irrigation facilities is a limitation in HWS, participatory forestry programme was widely adopted by the participants, for a production purpose more than for a conservation purpose. However, as participants are well convinced with the idea of user rights of timber and non-timber forest products generated from forest trees planted by them, a trend in protecting and managing planted forest trees was evident in both NWS and HWS.
- It was evident in NWS that tree planting in road reservation helps demarcating the boundaries of home gardens and other lands. Thus the participants have attached a value to the programme.
- A particular emphasis of the villages in Illukpitiya on conserving the forest in the sub-watershed of Bovitiya Dola in NWS was evident, mainly because of the use of a hydropower facility by a majority of villages.
- As commented by a number of villages' officials and FOs, the expansion of tea smallholdings has been hampered due to the increase interest on conservation.

Conclusions

- **Impacts of Productivity Improvement and Conservation**
 - The main impact expected out of productivity improvement was increasing the farm income thereby reducing the poverty and pressure on unsustainable usage of natural resources. The total package of the home garden development programme comprises of mainly perennial crops except in the case of semi-perennial crops such as banana, lime and lemon. Therefore a positive net contribution to the farm income can only be expected after about five years of establishment. The indicative financial analysis presented in Appendix showed a very low NPV of Rs 5 800 for a period of 10 years and 28% IRR. The resource poor farmers need a short-term income, which is lacking in the productivity component of SCOR (see Appendix). Participatory forestry programme will yield positive impact only after about 15 years as many trees planted are forest timber trees.
 - Home garden development component has a positive impact on the farming system in terms of ecological improvement giving multi-layer-cropping system, preservation of bio-diversity stabilise the micro-climate of the home garden, and recycling of organic matter.
 - Increase conservation of forest areas will negatively impact on expansion of tea smallholdings.
- **Sustainability**
 - It is evident that a continuous intervention is necessary to maintain the production and conservation standards of the home garden that were established. For instance, as there is a high mortality of plants, an on-going or user-requested system should be available for the farmers to obtain planting material for vacancy filling. There should be an effective extension and advisory service available with easy access for the farmers to receive technical advice. Farmers lack these services and this will seriously hamper the sustainability.
 - Discussions with the farmers and the observations revealed that the continuation of home garden level soil conservation methods cannot be expected due to the following reasons:
 - Very few farmers in both locations are aware of marking contour lines for establishing any conservation method.
 - There is no line agency linkage with the farmers to advise, assist and encourage them to establish conservation methods in Huruluwewa. Although the line agency linkages are very well established in Nilwala, it is difficult to expect that farmers on their own request line agency officers to assist them in adopting soil conservation measures in home gardens as conservation measures yield very limited financial benefits.
 - As farmers reported, the opportunity cost of labour in practising soil conservation methods is a deterrent for them to continue in both locations.
 - Discussions in both HWS and NWS revealed that farmers have not experienced an increase in the production which can be attributed to conservation and thus were motivated to practice conservation.
 - The planting material production programme will be able to continue only if people purchase them. The discussions revealed that farmers are not willing to buy planting material and plant for conservation purposes. Exception to this common observation is the villages who are willing to produce planting material at home and plant in sub-watershed where hydropower is available.
 - The interest on conservation of forest, stream reservation and road reservation will sustain as long as there is adequate marketable production from the total land under the command of the family. If this objective is overlooked, which is a likely event for many farmers in HWS, the expansion of conservation efforts will not be maintained. When farmers of HWS were questioned about the food production potential after four years of participatory forestry effort (after four years participants cannot use the land under forest trees for annual crop production), it revealed that some land has to be utilised for consumption purposes. This additional land will obviously come from the forest and *chena* cultivation may set in.
 - In the *chena* stabilisation programme in HWS, participants have almost the same resource base and hence an overall production and income increase for the participants of the programme cannot be expected. Hence the participants will have to face one of two situations namely (a) those who got ownership rights and participated in agro-forestry programme will

have less land area available for crop cultivation after about five years when there is a canopy cover and thick shade from forest trees and (b) those who got user rights of forest trees and right to use land for annual crops only during the first four years. In both cases farmers should find alternative income sources for survival and sustainability of the conservation efforts.

- Lessons

- The income generation ability of the conservation oriented farming systems in home gardens of HWS and NWS, and tea land in NWS and stabilised *chena* cultivation with agro-forestry component in HWS should be investigated. The resource base required, economic viability of cropping systems, employment generation and marketing aspects should be focused in the investigation. If these factors are satisfactory in terms of farmers' requirements, the conservation oriented farming systems could be considered as sustainable and replicable.
- As income generation is essential to reduce the pressure on conserved land, marketing opportunities should be explored for fruits that will be harvested in conserved forest, stream reservation and home gardens, and other non-timber forest products. The Farmers Company Structure should be utilised in this arrangement.
- Income generating or some other essential service component should be linked with the conservation programme to motivate farmers to undertake conservation.
- Farming system approach should be adopted and proper diagnosis should be launched to identify most suitable soil and moisture conservation practice for an individual farm. Evidence showed that inappropriate methods have not been accepted or even accepted did not sustain.

ANNEX 8 INCREMENTAL NET BENEFITS AND PROFITABILITY OF A TYPICAL HOME GARDEN IMPROVEMENT MODEL

Type of Trees in a typical HG model in NWS / HWS	Number of plants	Net Benefits of each crop computed for the number of crops in the home garden model (Rs)									
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
Mango	5	-3,477	-125	-125	-100	2,493	2,493	2,493	2,493	2,493	2,493
Lime	10	-500	0	0	700	800	800	800	800	800	800
Oranges	5	-1 360	-136	-50	-50	0	1 401	1 401	1 401	1 401	1 401
Banana	10	-775	353	353	353	353	353	353	353	353	353
Cashew	2	-6	20	0	0	0	0	0	5	70	137
Coconut	10	-1 254	-100	-100	-100	-100	-100	1 149	1 149	1 149	1 149
Jack	3									200	200
Teak	10										0
Acacia	3										0
Total NR	Rs	-7 371	12	78	803	3 546	4 947	6 196	6,201	6 466	6 533
IRR		28%									
NPV (10 years 15% DR)	Rs	5820									
B/C Ratio (10 years 15% DR)		1.8									

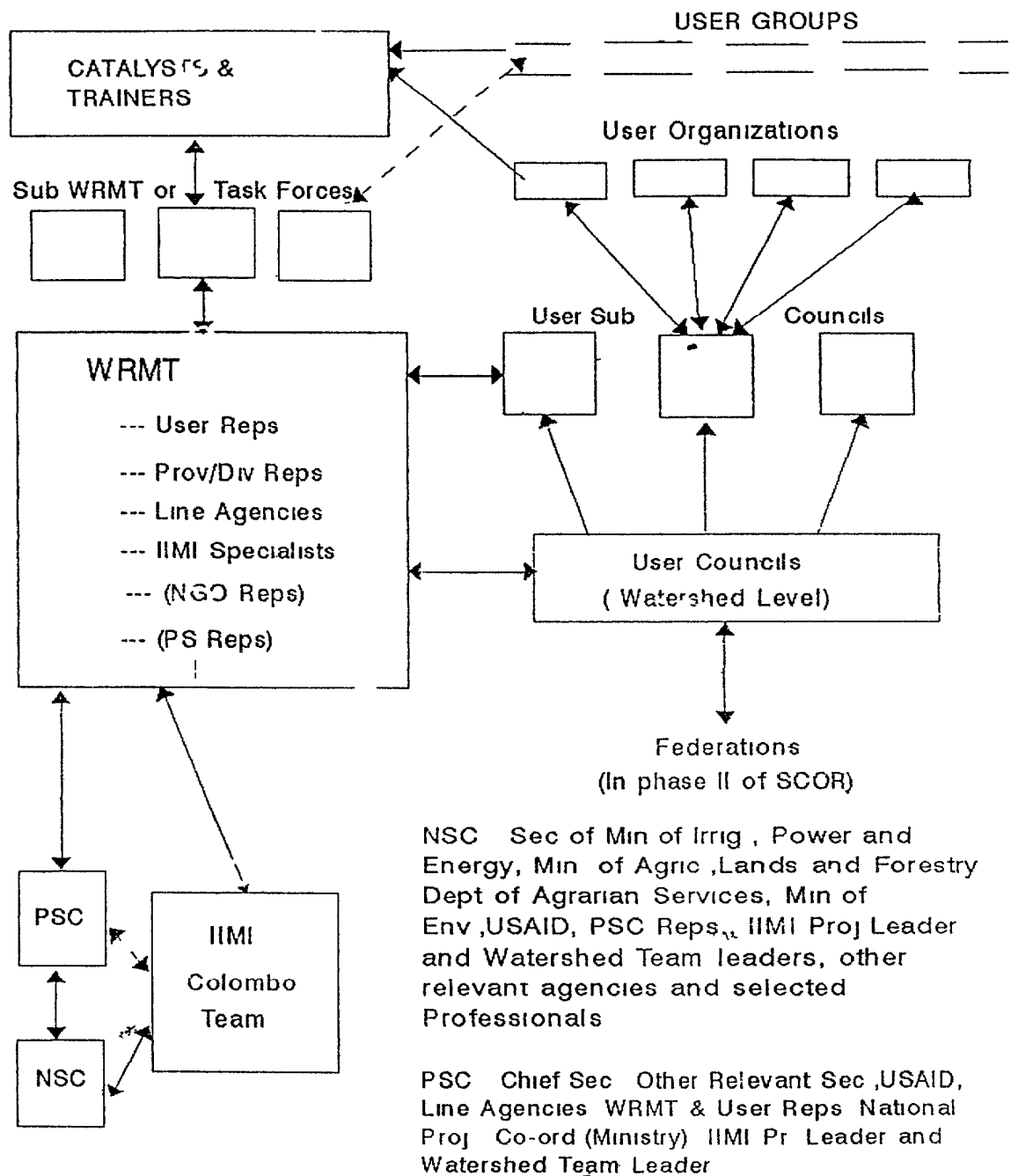
Assumptions

Labour cost is assumed at Rs 150 / md

Standard inputs package is used

Yield levels are obtained from Economic Director GTZ & Agriculture Department, 1993

SCOR Project Organizational Structure



Legend

WRMT - Watershed Resources Management Team

PSC - Provincial Steering Committee

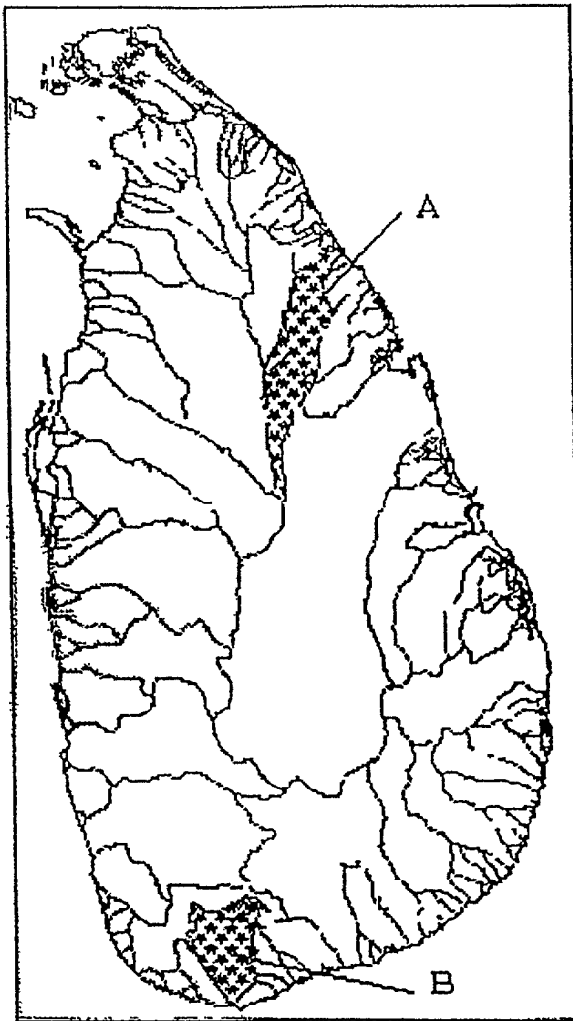
NSC - National Steering Committee

PROV - Provincial

Div - Divisional

REPS - Representation

PS - Private Sector



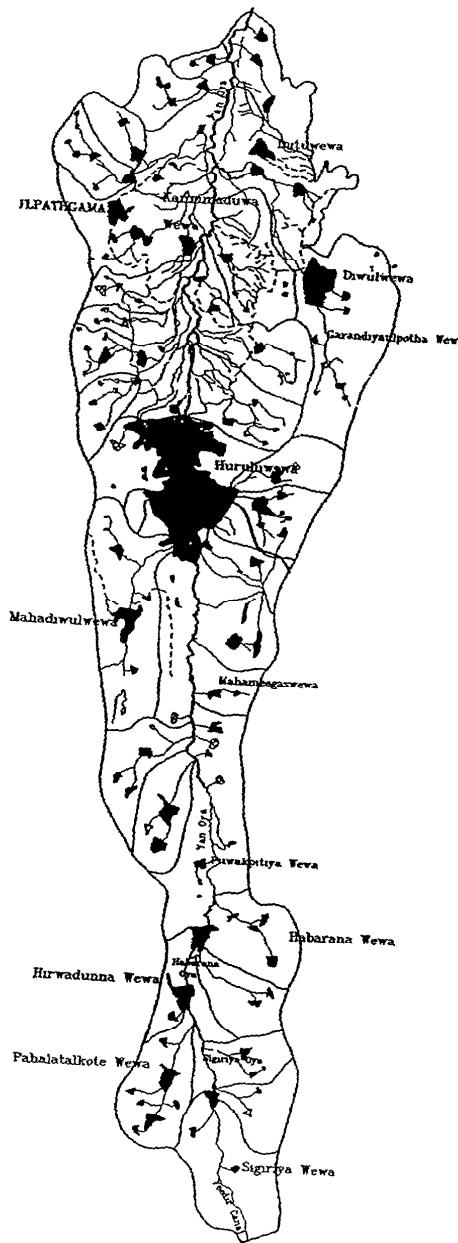
Pilot watersheds -

A - Huruluwewa Watershed

B - Nilwala Watershed



River Basins



- Working Tank
- Abandoned Tank
- Watershed Boundary
- Sub Watershed Boundary
- Yan Oya
- Stream/Natural Canal
- Irrigation Canal



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